Micro System **MC-70/21/21M/22/37**

Service
Service
Service

Service Manual

COMPACT
disc
DIGITAL AUDIO

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CLASS 1
LASER PRODUCT

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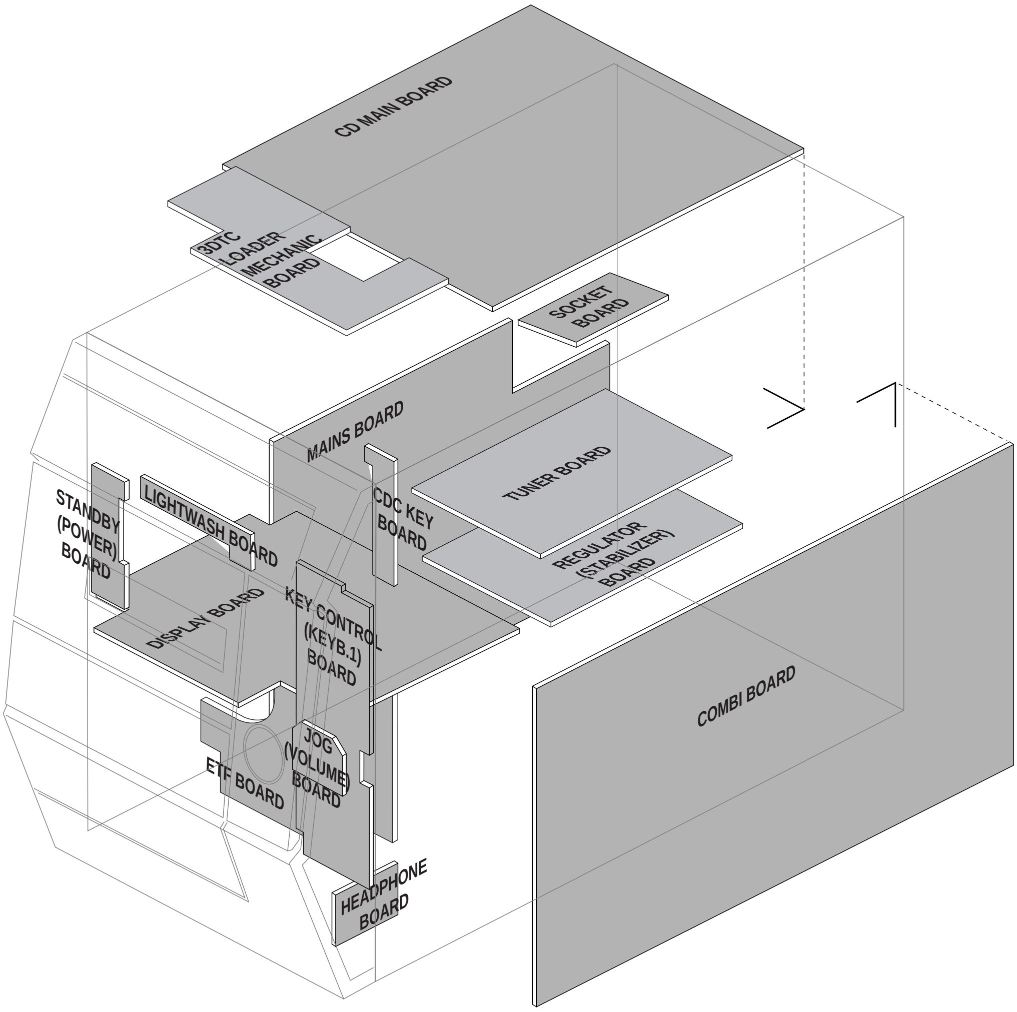
GB 3139 785 22720

PHILIPS

LOCATION OF PC BOARDS


CD MAIN BOARD
3DTC LOADER MECHANIC BOARD
SOCKET BOARD
MAINS BOARD
TUNER BOARD
STANDBY (POWER) BOARD
LIGHTWASH BOARD
CDC KEY BOARD
REGULATOR (STABILIZER) BOARD
DISPLAY BOARD
KEY CONTROL (KEYB.1) BOARD
COMBI BOARD
JOG (VOLUME) BOARD
ETF BOARD
HEADPHONE BOARD

VERSION VARIATIONS:

Type /Versions:	MC-70							
Features & Board in used:	/21	/21M	/33	/22	/37			
Incredible Surround	x	x	x	x	x			
Karaoke								
News				x				
RDS				x				
Rotary Encoder (volume control)	x	x	x	x	x			
Jog Shuttle								
Voltage Selector	x	x						
Aux Input	x	x	x	x	x			
Digital Output	x	x	x	x	x			
Headphone Socket	x	x	x	x	x			
Line Output								
Subwoofer Output	x	x	x	x	x			
Surround Output								
Matrix Surround Loudspeakers								
Normal Standby with Clock Display	x	x	x	x	x			
ECO Power (LPS or Low Power Standby)				x				
ECO6 Tuner board - System Non-Cenelec	x	x	x		x			
ECO6 Tuner board - System Cenelec				x				

SPECIFICATIONS

GENERAL:

Mains voltage : 110-127V/220-240V Switchable for /21/21M
220-230V for /22
120V for /37
Mains frequency : 50/60Hz
Power consumption : < 15W at Standby (Demo off)
< 1W at Eco Power Standby /22
< 80W Active
Clock accuracy : < 4 seconds per day
Dimension centre unit : 175 x 244 x 322mm

TUNER:

FM

Tuning range : 87.5-108MHz
Grid : 50kHz
100kHz for /37
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75Ω coaxial
300Ω click fit for /37
Sensitivity at 26dB S/N : < 7µV
Selectivity at 600kHz bandwidth : > 25dB
Image rejection : > 25dB
Distortion at RF=1mV, dev. 75kHz : < 3%
-3dB Limiting point : < 8µV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB

MW

Tuning range : 531-1602kHz
530-1700kHz for /21/37
Grid : 9kHz
10kHz for /21/37
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.0mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5%

LW

Tuning range : 153-279kHz for /22
Grid : 3kHz
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : [< 6.0mV/M]
Selectivity at 18kHz bandwidth : [> 24dB]
IF rejection : [> 45dB]
Image rejection : [> 30dB]
Distortion at RF=50mV, m=80% : [< 5%]

AMPLIFIER:

Output power : 2 x 50W RMS [1] /22
2 x 40W FTC [2] /37
Frequency response within -3dB : 50Hz-16kHz
Treble control : 12.5kHz ± 3 steps [3]
Bass control : 55Hz ± 3 steps [3]
Incredible Sound : ON/OFF [3]
wOOx Level control : 3, 2, 1, OFF [3]
Headphone output at 32Ω : 680mV ± 1dB
Sub-woofer output : 1.5V ± 3dB at 22kΩ
Digital output (IEC958, 44.1kHz) : 0.5Vp-p
Aux / CDR input : 500mV / 1V ± 2dB at 600Ω

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76 cm/sec ± 2%
Wow and flutter : < 0.4% DIN
Fast-wind/rewind time C60 : 130 sec
Bias system : 75kHz ± 10kHz
Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz
Signal to noise ratio Type I : > 47dBA
Type II : > 52dBA

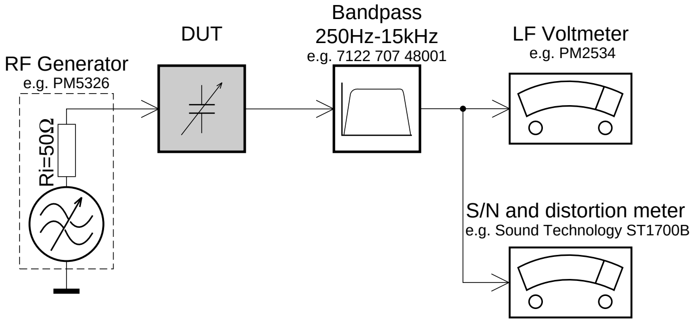
COMPACT DISC:

Measurement done at output conn. of the 3DTC module.
Frequency response within +0/-2dB: 20Hz - 20kHz
Output level (in Vrms) : 550mV, Z_{out} = 100Ω
Signal/Noise ratio (A-weighted) : > 76dBA
Distortion at 1kHz : < 0.02%
Channel unbalance at 1kHz : ±1dB
Channel separation at 1kHz : > 79dB
De-emphasis : Switched by subcode on the disc

[....] Values indicated are for "Cenelec version" only
[1] 6Ω, 1kHz, 10% THD
[2] 6Ω, 60Hz - 12,5kHz, 10% THD
[3] Frequency response in each setting is software controlled.

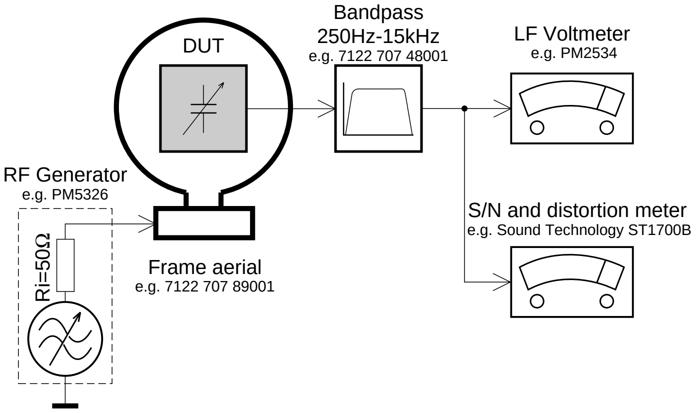
MEASUREMENT SETUP

Tuner FM


Bandpass
250Hz-15kHz
e.g. 7122 707 48001
DUT
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

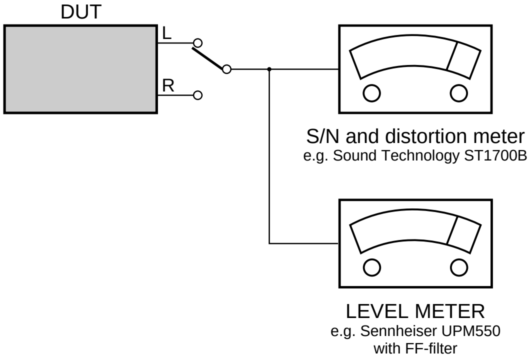
Tuner AM (MW,LW)


Bandpass
250Hz-15kHz
e.g. 7122 707 48001
DUT
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B
Frame aerial
e.g. 7122 707 89001

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

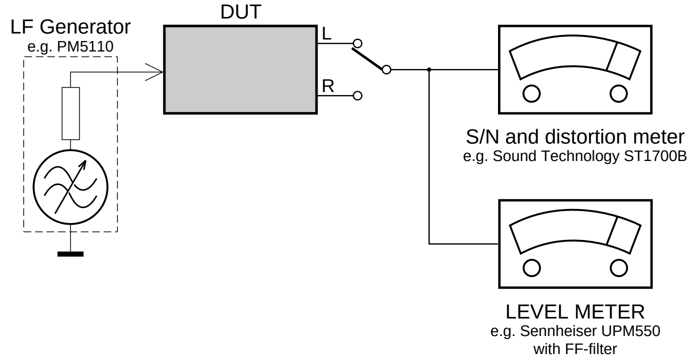
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071


LF Generator
e.g. PM5110
DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

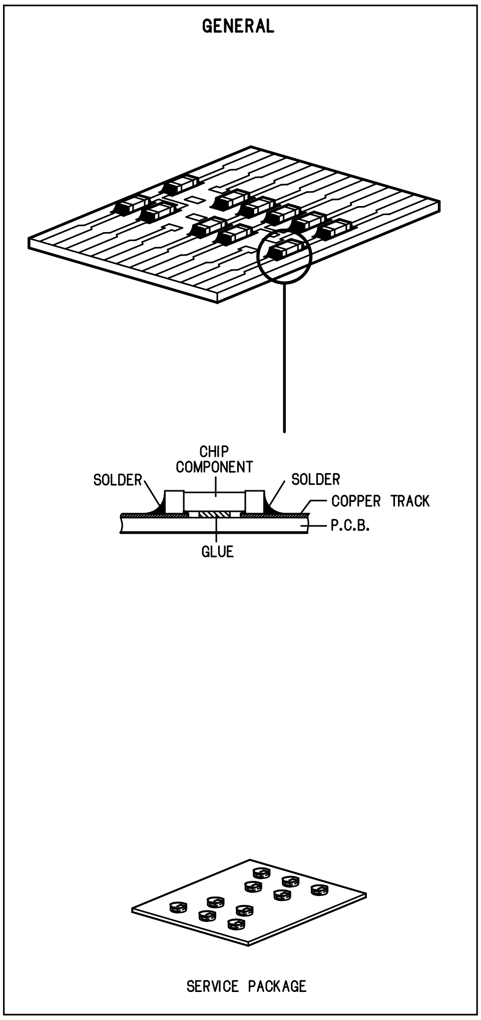
Compact Disc:

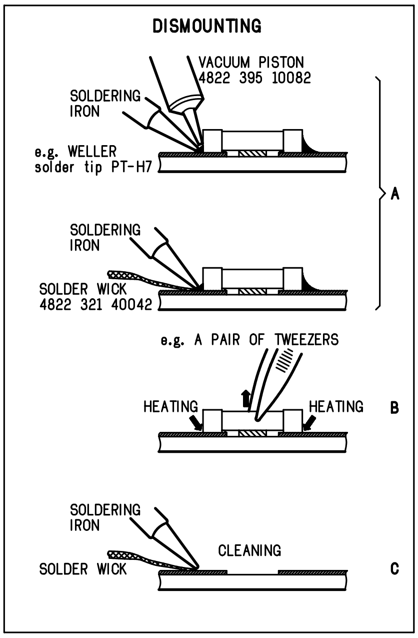
SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

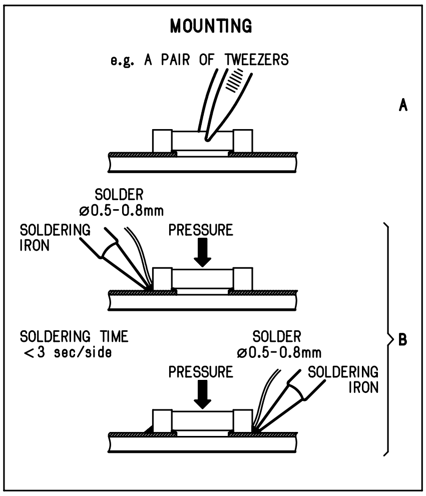
ESD Equipment:

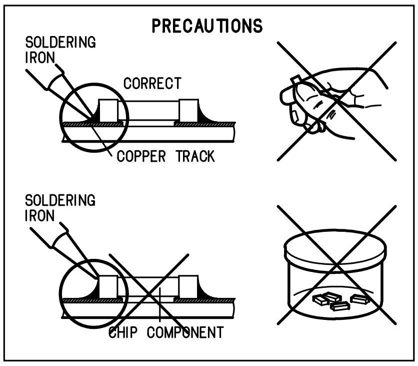
Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1MΩ)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

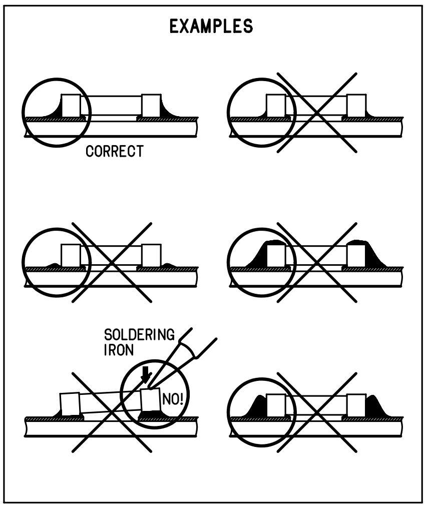
HANDLING CHIP COMPONENTS


GENERAL
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
P.C.B.
GLUE
SERVICE PACKAGE


DISMOUNTING
VACUUM PISTON
4822 395 10082
SOLDERING IRON
e.g. WELLER solder tip PT-H7
A
SOLDERING IRON
SOLDER WICK
4822 321 40042
e.g. A PAIR OF TWEEZERS
HEATING
HEATING
B
SOLDERING IRON
CLEANING
SOLDER WICK
C


MOUNTING
e.g. A PAIR OF TWEEZERS
A
SOLDER
⌀0.5-0.8mm
SOLDERING IRON
PRESSURE
SOLDERING TIME
<3 sec/side
SOLDER
⌀0.5-0.8mm
PRESSURE
SOLDERING IRON
B


PRECAUTIONS
SOLDERING IRON
CORRECT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT


EXAMPLES
CORRECT
SOLDERING IRON
NO!

GB **WARNING**

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

F **ATTENTION**

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

ESD

D **WARNUNG**

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

NL **WAARSCHUWING**

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

I **AVVERTIMENTO**

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

GB

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

NL

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

F

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

D

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

I

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

CLASS 1
LASER PRODUCT
3122 110 03420

GB **Warning !**

Invisible laser radiation when open.
Avoid direct exposure to beam.

S **Varning !**

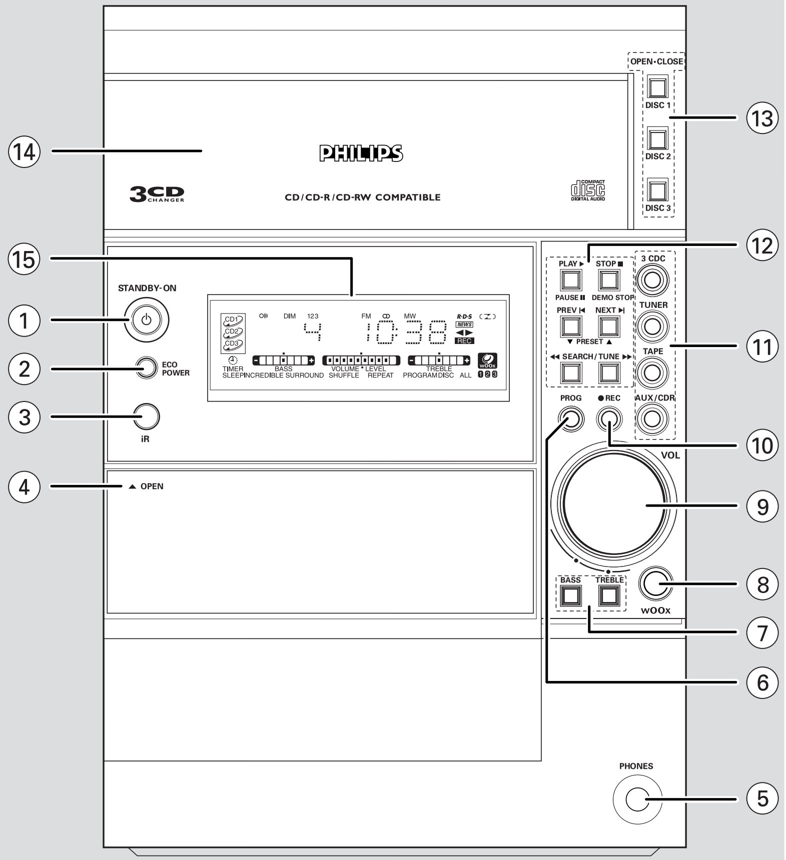
Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

SF **Varoitus !**

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

DK **Advarse !**

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.


⑭
⑮
①
②
③
④
⑬
⑫
⑪
⑩
⑨
⑧
⑦
⑥
⑤
PHILIPS
3CD CHANGER
CD/CD-R/CD-RW COMPATIBLE
OPEN•CLOSE
DISC 1
DISC 2
DISC 3
STANDBY-ON
ECO POWER
iR
OPEN
PLAY ▶
STOP ■
PAUSE ❚❚
DEMO STOP
PREV |◀
NEXT ▶|
▼ PRESET ▲
◀◀ SEARCH/TUNE ▶▶
3 CDC
TUNER
TAPE
AUX/CDR
PROG
● REC
VOL
BASS
TREBLE
wOOx
PHONES

English

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General Information

This product complies with the radio interference requirements of the European Community.

Environmental Information

All unnecessary packaging has been omitted. We have tried to make the packaging easy to separate into three materials: cardboard (box), polystyrene foam (buffer) and polyethylene (bags, protective foam sheet).

Your system consists of materials which can be recycled and reused if disassembled by a specialised company. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

Acknowledgement

Energy Star

As an ENERGY STAR® Partner, Philips has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

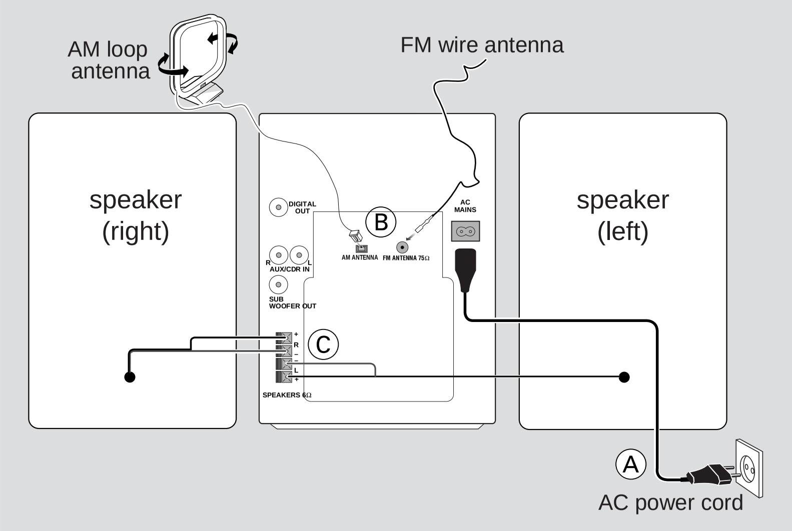
Supplied accessories

– Remote control
– Batteries (two AA size) for remote control
– AM loop antenna
– FM wire antenna
– AC power cord

Safety Information

- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer.
- Place the system on a flat, hard and stable surface.
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system. Allow at least 10 cm (4 inches) clearance from the rear and the top of the unit and 5 cm (2 inches) from each side.
- Do not expose the system, batteries or discs to excessive moisture, rain, sand or heat sources caused by heating equipment or direct sunlight.
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the disc unit inside the system. Should this occur, the CD player would not operate normally. Leave the power on for about one hour with no disc in the system until normal playback is possible.
- The mechanical parts of the set contain self-lubricating bearings and must not be oiled or lubricated.
- **When the system is switched to Standby mode, it is still consuming some power. To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

Preparations



Rear Connections

The type plate is located at the rear of the system.
For users in the U.K.: please follow the instructions on page 2.

Ⓐ **Power**

Before connecting the AC power cord to the wall outlet, ensure that all other connections have been made.

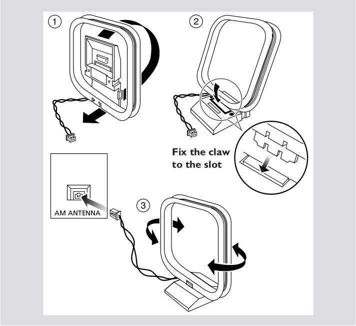
WARNING!
– For optimal performance, use only the original power cable.
– Never make or change connections with the power switched on.

To avoid overheating of the system, a safety circuit has been built in. Therefore, your system may switch to Standby mode automatically under extreme conditions. If this happens, let the system cool down before reusing it *(not available for all versions)*.

Ⓑ **Antennas Connection**

Connect the supplied AM loop antenna and FM antenna to the respective terminals. Adjust the position of the antenna for optimal reception.

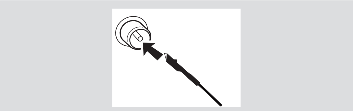
AM Antenna



- Position the antenna as far as possible from a TV, VCR or other radiation source.

Preparations

FM Antenna

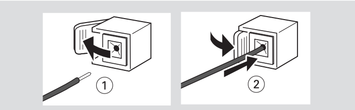


- For better FM stereo reception, connect an outdoor FM antenna to the FM ANTENNA terminal.

Ⓒ Speakers Connection

Front Speakers

Connect the speaker wires to the SPEAKERS (FRONT) terminals, right speaker to "**R**" and left speaker to "**L**", coloured (marked) wire to "+" and black (unmarked) wire to "−".



- Clip the stripped portion of the speaker wire as shown.

Notes:
– For optimal sound performance, use the supplied speakers.
– Do not connect more than one speaker to any one pair of +/− speaker terminals.
– Do not connect speakers with an impedance lower than the speakers supplied. Please refer to the SPECIFICATIONS section of this manual.

Optional Connections

The optional equipment and connecting cords are not supplied. Refer to the operating instructions of the connected equipment for details.

Subwoofer Out Connection

Connect the subwoofer to the **SUBWOOFER OUT** terminal. The subwoofer reproduces just the low bass sound effect (explosions or the rumble of spaceships, for example).

Connecting other equipment to your system

Connect the audio left and right OUT terminals of a TV, VCR, Laser Disc player, DVD player or CD Recorder to the **AUX/CDR IN** terminals.

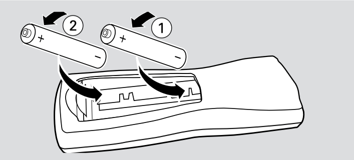
Note:
– If you are connecting equipment with a monaural output (a single audio out terminal), connect it to the AUX/CDR IN left terminal. Alternatively, you can use a "single to double" cinch cable (still be mono sound).

Digital Out Connection

Connect this digital output when recording on any audio equipment with digital input (CD Recorder, Digital Audio Tape [DAT] deck, Digital to Analogue Converter and Digital Signal Processor, for example). Use a cinch cable to connect the **DIGITAL OUT** terminal to the digital input terminal of the equipment.

Inserting batteries into the Remote Control

Insert two batteries (Type R06 or AA) into the remote control with the correct polarity as indicated by the + and − symbols inside the battery compartment.



CAUTION!
– Remove batteries if they are exhausted or not to be used for a long time.
– Do not use old and new or different types of batteries in combination.
– Batteries contain chemical substances, so they should be disposed off properly.

Controls *(main system's illustration on page 3)*

Controls on the system and remote control

① **STANDBY ON ⏻**
– to switch the system on or to Standby mode.

② **ECO POWER**
– to switch the system on or to Eco Power Standby mode.

③ **iR**
– infrared sensor for remote control.

④ **⏶ OPEN**
– to open the tape deck door.

⑤ **PHONES**
– to connect headphones.

⑥ **PROG (PROGRAM)**
for CD .... to programme disc tracks.
for TUNER .... to programme preset radio stations.
for CLOCK .... to select 12- or 24-hour clock mode.

⑦ **BASS/TREBLE**
– to select BASS or TREBLE sound feature.
BASS/TREBLE +/− *(on the remote control)*
– to increase or decrease the low or high tone level for the respective BASS or TREBLE sound feature selected.

⑧ **wOOx** *(for model MC-70 only)*
– *(on the system only)* to select the next wOOx level or switch off wOOx sound effect.
– *(on the remote control only)* to switch on or off the wOOx sound effect.
wOOx LEVEL
– *(on the remote control only)* to select desired wOOx level : WOOX 1, WOOX 2 or WOOX 3.

⑨ **VOL (VOLUME +/−)**
– to increase or decrease the volume.
– *(on the system only)* to increase or decrease the low or high tone level for the respective BASS or TREBLE sound feature selected.

⑩ **● REC**
– to start recording on a tape.

⑪ **SOURCE** – to select the following:
3CDC (CD 123)
– to select disc tray 1, 2 or 3.
TUNER
– to select waveband : FM, MW or LW.
TAPE
– to select tape mode.

AUX / CDR
– to select a connected external source : CDR or AUX (auxiliary) mode.

⑫ **Mode Selection**
PLAY PAUSE ▶❚❚
for CD .... to start or interrupt playback.
for TAPE .... to start playback.
for PLUG & PLAY…*(on the system only)* to initiate and start plug & play mode.
STOP/DEMO STOP ■
for CD .... to stop playback or to clear a programme.
for TUNER .... to stop programming.
.... *(on the system only)* to delete the preset radio station.
for TAPE .... to stop playback or recording.
for DEMO .... *(on the system only)* to activate/deactivate the demonstration.
for CLOCK .... to exit clock setting or cancel timer.
for PLUG & PLAY…*(on the system only)* to exit plug & play mode.
PREV / NEXT ⏮ ⏭ (PRESET ▼▲)
for CD .... to skip to the beginning of the current, previous, or next track.
for TUNER .... to select a preset radio station.
for TAPE .... to select tape side (back or front).
for CLOCK .... to set the minute.
SEARCH / TUNE ◀◀ ▶▶
for CD .... to search backward/forward.
for TUNER .... to tune to a lower or higher radio frequency.
for TAPE .... to rewind or fast forward.
for CLOCK .... to set the hour.

⑬ **OPEN•CLOSE (DISC 1/DISC 2/DISC 3)**
– to open or close the individual disc tray : DISC 1, DISC 2 or DISC 3

⑭ **DISC TRAYS**

⑮ **DISPLAY SCREEN**
– to view the current status of the system.

⑯ **MUTE**
– to interrupt or resume sound reproduction.

⑰ **CD DIRECT 1/2/3**
– to select a disc tray for playback.

⑱ **IS (INCREDIBLE SURROUND)**
– to activate or deactivate the surround sound effect.

Controls

⑲ **DIM**
– to select various dim mode : DIM 1, DIM 2, DIM 3 or DIM OFF.

⑳ **AUTO REV. (AUTO REVERSE)**
– to select the desired tape playback modes.

㉑ **TIMER**
– to display timer or set the timer.

㉒ **REPEAT**
– to playback track(s)/disc(s)/programme repeatedly.

㉓ **SHUFFLE**
– to playback all available discs and their tracks/ programme in random order.

㉔ **TIMER ON/OFF**
– to activate or deactivate the timer function.

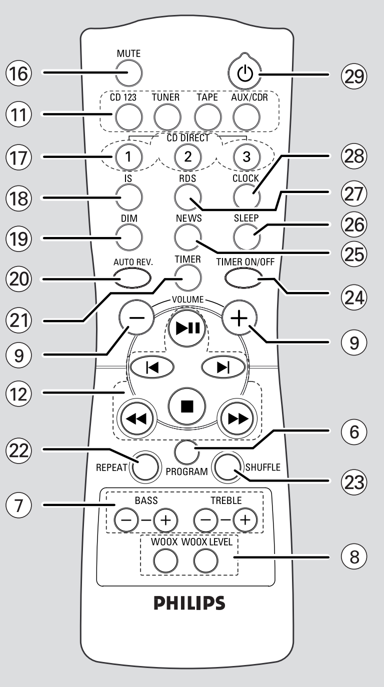
㉕ **NEWS**
– to hear News automatically.

㉖ **SLEEP**
– to activate, deactivate or set the sleep timer function.

㉗ **RDS**
– to select RDS information.

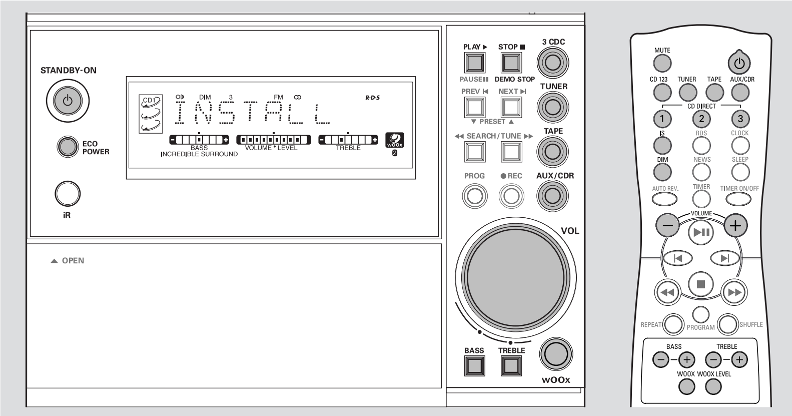
㉘ **CLOCK**
– to display clock or set the clock.

㉙ ⏻
– to switch the system to Standby mode or Eco Power Standby mode.


MUTE
CD 123
TUNER
TAPE
AUX/CDR
CD DIRECT
1
2
3
IS
RDS
CLOCK
DIM
NEWS
SLEEP
AUTO REV.
TIMER
TIMER ON/OFF
VOLUME
REPEAT
PROGRAM
SHUFFLE
BASS
TREBLE
WOOX
WOOX LEVEL
PHILIPS
⑯
⑪
⑰
⑱
⑲
⑳
㉑
9
⑫
㉒
7
㉙
㉘
㉗
㉖
㉕
㉔
9
6
㉓
8

Notes for remote control:
– First, select the source you wish to control by pressing one of the source select keys on the remote control (CD 123 or TUNER, for example).
– Then select the desired function (▶, I◀, ▶I, for example).

Basic Functions


STANDBY-ON
ECO POWER
iR
OPEN
INSTALL
RDS
BASS
INCREDIBLE SURROUND
VOLUME
LEVEL
TREBLE
PLAY ▶
STOP ■
3 CDC
PAUSE II
DEMO STOP
TUNER
PREV I◀
NEXT ▶I
PRESET
SEARCH / TUNE
TAPE
PROG
● REC
AUX/CDR
VOL
BASS
TREBLE
wOOx
MUTE
CD 123
TUNER
TAPE
AUX/CDR
CD DIRECT
IS
RDS
CLOCK
DIM
NEWS
SLEEP
AUTO REV.
TIMER
TIMER ON/OFF
VOLUME
REPEAT
PROGRAM
SHUFFLE
WOOX
WOOX LEVEL

IMPORTANT!
Before operating the system, complete the preparation procedures.

Plug and Play

Plug and Play allows you to store all available RDS stations and radio stations automatically.

If Plug and Play has not been installed

1 When you turn on the system, "AUTO INSTALL - PRESS PLAY" will be displayed.

2 Press **PLAY ▶ (▶II)** on the system to start installation.
➜ "INSTALL" will be displayed and followed by "TUNER" and then "AUTO".
➜ **PROGRAM** will start flashing.
➜ The system will search for all RDS stations and then continue with radio stations on FM, MW and LW band respectively. Weak RDS stations may be stored in later presets.
➜ All available RDS and radio stations with sufficient signal strength will be stored automatically.
➜ The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
➜ The last preset radio station or the first available RDS station will play when Plug and Play is completed.

3 The system will proceed to set the RDS time automatically with the stored RDS preset station.

- If no RDS station is found in the first preset station;
➜ The programme will exit automatically.
- If RDS radio station is found;
➜ "INSTALL" will be displayed and followed by "TIME".
- When searching RDS time;
➜ "SEARCH RDS TIME" will be displayed.
➜ When RDS time is read, "RDS TIME" will be displayed. The current time will be displayed for 2 seconds and stored automatically.
➜ If RDS station does not transmit RDS time within 90 seconds, the programme will exit automatically and the display will show "NO RDS TIME".

To reinstall Plug and Play

1 In Standby or Demonstration mode, press and hold **PLAY ▶ (▶II)** on the system until "AUTO INSTALL - PRESS PLAY" is displayed.

2 Press **PLAY ▶(▶II)** again to start installation.
➜ All previously stored radio stations will be replaced.

To exit without storing the Plug and Play

- Press ■ on the system.

Basic Functions

Notes:
– When the power is turned on, the disc tray may open and close to initialise the system.
– If you do not complete Plug and Play installation, Plug and Play will be reinitiated the next time you turn on the power.
– If no stereo frequency is detected during Plug and Play, "CHECK ANTENNA" will be displayed.
– During Plug and Play, if no button is pressed within 15 seconds, the system will exit Plug and Play mode automatically.

Demonstration mode

The system has a demonstration mode that shows the various features offered by the system.

To activate the demonstration

- In Standby mode, press and hold **DEMO STOP** on the system until "DEMO ON" is displayed.
  ➜ The demonstration will begin.

To deactivate the demonstration

- Press and hold **DEMO STOP** on the system until "DEMO OFF" is displayed.
  ➜ The system will switch to Standby mode.

Note:
– Even if you remove the AC power cord and reconnect it to the wall socket, the demonstration will remain off until you activate it again.

Switching the system on

In Standby/Demonstration mode

- Press **STANDBY ON**.
  ➜ The system will switch to the last selected source.
- Press **3CDC (CD 123)**, **TUNER**, **TAPE**, **AUX/CDR**.
  ➜ The system will switch to the selected source.
- Press any one of the disc **OPEN•CLOSE (DISC 1 / DISC2 / DISC 3)** button.
  ➜ The system will switch to CD mode.

In Eco Power Standby mode

- Press **ECO POWER**.
  ➜ The system will switch to last selected source.
- Press **CD 123**, **TUNER**, **TAPE** or **AUX/CDR** on the remote control.
  ➜ The system will switch to the selected source.

Switching the system to Standby mode

In Demonstration mode

- Press and hold **DEMO STOP** on the system.

In any other source mode (except Eco Power Standby mode)

- Press **STANDBY ON** (or ⏻ on the remote control).
  ➜ The clock will appear on the display when the system is in Standby mode.

Switching the system to Eco Power Standby mode (< 1 Watt)

- Press **ECO POWER** (or press and hold ⏻ on the remote control).
  ➜ "ECO PWR" will be displayed, then the display screen will go blank.
  ➜ The low power ECO POWER LED will be lighted.

Note:
– If you have not deactivated the demonstration, it will resume five seconds after the system switches to Eco Power Standby or Standby mode.

Power Saving Automatic Standby

As a power-saving feature, the system will automatically switch to Standby mode if you do not press any buttons within 30 minutes after a disc or tape has stopped playing.

Basic Functions

Dim mode

You can select the desired brightness for the display.

- Press **DIM** on the remote control repeatedly to select DIM 1, DIM 2, DIM 3 or DIM OFF display mode.
  ➜ **DIM** and the corresponding mode number will appear on the display, except for DIM OFF mode.

DIM OFF	All available LEDs light up, display screen will have full brightness, music level bar active.
DIM 1	Some LEDs light up, display screen will have full brightness, music level bar inactive.
DIM 2	All lightings turn off, display screen will have full brightness, music level bar inactive.
DIM 3	All lightings turn off, display screen will be at half brightness, music level bar inactive.

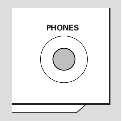
← **music level bar**

Volume Control

Adjust **VOL** to increase (turn knob clockwise or press VOLUME +) or decrease (turn knob anti-clockwise or press VOLUME −) the sound level.
➜ "-XX dB" will be displayed. "XX" denotes the volume level.
➜ When reached the minimum volume level, "VOL MUTE" will be displayed.

To listen through the headphones

- Connect the headphones plug to the **PHONES** socket at the front of the system.
  ➜ The speakers will be muted.



To switch off the volume temporarily

- Press **MUTE** on the remote control.
  ➜ Playback will continue without sound and "MUTE" will be displayed.
- To restore the volume, press **MUTE** again or increase the volume level.

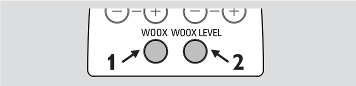
Interactive Sound Control

For optimal sound listening, you are only able to select BASS/TREBLE or wOOx at a time *(for model MC-70 only)***.**

wOOx *(for model MC-70 only)*
There are three wOOx settings to enhance the bass response.

- Press **wOOx** on the system repeatedly to select the next wOOx level or switch off the wOOx effect.

OR



1 Press **wOOx** on the remote control to switch ON (enhanced) or OFF (normal) the wOOx sound effect.
2 When wOOx is switched on, press **wOOx LEVEL** on the remote control repeatedly to select the desired wOOx level : WOOX 1, WOOX 2, WOOX 3 or WOOX OFF.
➜ If "WOOX 1, 2 or 3"" is selected, **woox** and the corresponding level number will appear on the display.
➜ If "WOOX OFF"" is selected, the wOOx sound effect will be switched off.

Notes:
– When switched off the wOOx effect, the last Bass/Treble will resume automatically.
– Some discs or tapes might be recorded in high modulation, which causes a distortion at high volume. If this occurs, deactivate wOOx or reduce the volume.

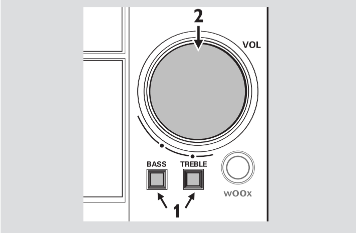
Basic Functions

Bass/Treble

The BASS (low tone) and TREBLE (high tone) feature enables you to define the sound-processor settings.

- ● Press **BASS** +/– or **TREBLE** +/– on the remote control repeatedly to select the next Bass or Treble level.

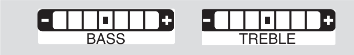
OR


2
VOL
BASS
TREBLE
wOOx
1

1 Press **BASS** or **TREBLE** on the system to select Bass or Treble sound feature.

2 Adjust the **VOL** on the system to select the desired Bass or Treble level.
➜ "BASS XX" or "TREB XX" will be displayed. "XX" denotes the level as follows :

MIN → -2 ...→ 0 → 1... → +2 → MAX ...


BASS
TREBLE

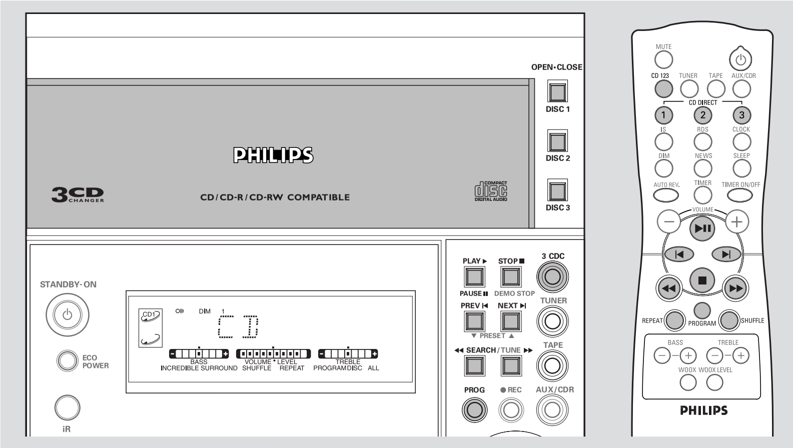
Notes:
– The volume knob can be used to adjust Bass/Treble level immediately after you have selected the respective Bass/Treble sound feature. If the volume knob is not used within 5 seconds, it will become normal volume control function.
– The Bass/Treble mode will exit automatically if wOOx feature selected (for model MC-70 only).

IS (Incredible Surround)

The Incredible Surround magnifies the virtual distance between the front speakers for an incredibly wide, enveloping, stereo effect.

- ● Press **IS** on the remote control repeatedly to activate/deactivate the surround sound effect.
➜ If activated, **INCREDIBLE SURROUND** will appear on the display and "INCR SURROUND" will be displayed.
➜ If deactivated, "IS OFF" will be displayed.

CD Operation


OPEN•CLOSE
DISC 1
DISC 2
DISC 3
PHILIPS
3CD CHANGER
CD/CD-R/CD-RW COMPATIBLE
STANDBY-ON
ECO POWER
iR
PLAY
STOP
PAUSE
DEMO STOP
PREV
NEXT
PRESET
SEARCH/TUNE
PROG
REC
3 CDC
TUNER
TAPE
AUX/CDR
BASS
INCREDIBLE SURROUND
VOLUME
LEVEL
SHUFFLE
REPEAT
TREBLE
PROGRAM
DISC
ALL
MUTE
CD 123
CD DIRECT
IS
RDS
CLOCK
DIM
NEWS
SLEEP
AUTO REV.
TIMER
TIMER ON/OFF
VOLUME
PROGRAM
WOOX
WOOX LEVEL
PHILIPS

IMPORTANT!
– This system is designed for regular discs. Therefore, do not use any accessories such as disc stabiliser rings or disc treatment sheets, etc., as offered on the market, because they may jam the changer mechanism.
– Do not load more than one disc into each tray.

Discs for Playback

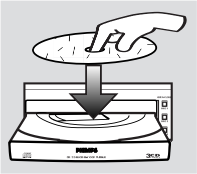
This system can playback all digital audio CD, finalised digital audio CD-Recordable (CDR) discs and finalised digital audio CD-Rewritable (CDRW)discs.

COMPACT disc DIGITAL AUDIO

COMPACT disc DIGITAL AUDIO Recordable

COMPACT disc DIGITAL AUDIO ReWritable

Loading Disc



1 Press **3CDC (CD 123)** to select CD mode.

2 Press one of the disc **OPEN•CLOSE** button **(DISC 1**, **DISC 2** or **DISC 3)** to open the desired disc tray.
➜ The selected disc tray slides out.

3 Load a disc with the label side facing up.

4 Press again the corresponding button to close the disc tray.
➜ "READING" will be displayed. The selected disc tray, total number of tracks and the playing time will appear on the display.

To select a desired disc tray

- ● Press **3CDC** (or **CD 123** on the remote control) repeatedly.
➜ "DISC 1", "DISC 2" or "DISC 3" will be displayed.

Notes:
– To ensure good system performance, wait until the disc trays completely read the disc(s) before proceeding.
– The CD changer is only able to read the status of the current selected disc tray.

CD Operation

Disc Playback

CD1	a disc is loaded in the disc tray
CD1	the current selected disc tray is empty
CD1	the current selected disc tray is loaded
CD1	the disc tray is currently playing

To playback all discs on the disc trays

- Press **PLAY ▶ (▶II)**.
  ➜ All the available discs will playback once, then stop.
  ➜ During playback, the selected disc tray, track number and elapsed playing time of the current track will appear on the display.

To playback one disc only

- Press one of the **CD DIRECT 1/2/3** buttons on the remote control.
  ➜ The selected disc will playback once, then stop.

To interrupt playback

- Press **PAUSE II (▶II)**.
  ➜ The current track time flashing.
- To resume playback, press **PLAY ▶ (▶II)** again.

To stop playback

- Press ■.

To search for a particular passage during playback

- Press and hold ◀◀ or ▶▶ and release it when the desired passage is located.
  ➜ During searching, the volume will be reduced.

To select a desired track

- Press |◀ or ▶| repeatedly until the desired track appears on the display.
- If playback is stopped, press **PLAY ▶ (▶II)** to start playback.

Note:
– In Shuffle mode, pressing |◀ will cause the player to skip only to the beginning of the current track.

To skip to the beginning of the current track during playback

- Press |◀ **once**.

To replace disc during playback

You are able to replace or load in disc into the other two disc trays without interrupting current playback.

- While playback, press the disc **OPEN•CLOSE** button of the inactive disc trays (refer to "Loading Disc").
- If you press disc **OPEN•CLOSE** button of the active disc tray, the disc will stop playing and the disc tray will slide out.
  ➜ Once the disc tray is opened, it will be deselected.

Programming the disc tracks

Programming tracks is possible when playback is stopped. Up to 40 tracks can be stored in the memory in any order.

1 Load the desired discs on the disc trays (refer to "Loading Disc").

2 Press **PROG** to start programming.
➜ **PROGRAM** will start flashing.

3 Press **3CDC** or **CD DIRECT 1/2/3** button to select a disc.

4 Press |◀ or ▶| repeatedly to select the desired track.

5 Press **PROG** to store the track.

- Repeat ***steps 3–5*** to store other discs and tracks.

6 Press **PLAY ▶ (▶II)** to start programme playback.
➜ "PLAY PROGRAM" will be displayed.

- To end programming without starting playback, press ■ **once** .
  ➜ The total number of tracks programmed and the total playing time will appear on the display.

Notes:
– If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "-- : --" will appear on the display instead of the total playing time.
– If you attempt to programme more than 40 tracks, "PROGRAM FULL" will be displayed.
*– If you press any of the CD DIRECT 1/2/3 buttons on the remote control, the system will playback the selected disc or track, and the stored programme will be ignored temporarily. The **PROGRAM** symbol also will disappear temporarily from the display. It will reappear when playback of the selected disc ends.*

CD Operation

– During programming, if no key is pressed within 20 seconds, the system will exit the Programme mode automatically.

To review the programme

- Stop playback and press |◀ or ▶| repeatedly.
- To exit review mode, press ■.

To erase the entire programme

- Press ■ **once** when playback is stopped or **twice** during playback.
  ➜ "PROGRAM CLEARED" will be displayed.
  ➜ **PROGRAM** will disappear from the display.

Note:
– The programme will be erased when the system is disconnected from the power supply or when the disc tray is opened.

Repeat

The current track, a disc, all available discs or all programmed tracks can be played repeatedly.

1 Press **REPEAT** on the remote control repeatedly to select various repeat modes.

- **In normal playback**
  ➜ "TRACK" – to repeat the current track, **REPEAT** will appear on the display.
  ➜ "DISC" – to repeat the entire disc, **REPEAT** and **DISC** will appear on the display.
  ➜ "ALL DISC" – to repeat all available discs, **REPEAT**, **DISC** and **ALL** will appear on the display.
- **In programme playback**
  ➜ "TRACK" – to repeat the current programmed track, **REPEAT** and **PROGRAM** will appear on the display.
  ➜ "PROGRAM" – to repeat all programmed tracks, **REPEAT**, **PROGRAM**, **DISC** and **ALL** will appear on the display.
- The selected track/disc(s)/programme will now be played repeatedly until you press ■.

2 To resume normal playback, press **REPEAT** until the "OFF" mode is displayed.
➜ **REPEAT** will disappear from the display.

Notes:
– Selecting SHUFFLE during repeat playback will cancel all repeat modes.
– Pressing any disc OPEN•CLOSE button will cancel all repeat modes.

Shuffle

All the available discs and their tracks or all the programmed tracks can be played in random order.

1 Press **SHUFFLE** on the remote control.
➜ **SHUFFLE** will appear on the display.

- The discs and the tracks will be played in random order until you press ■.

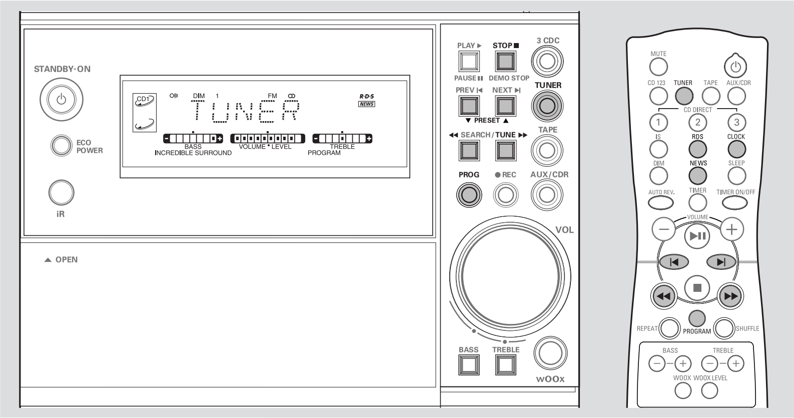
2 To resume normal playback, press **SHUFFLE** again.
➜ **SHUFFLE** will disappear from the display.

When select REPEAT mode during shuffling

- **In normal shuffled playback**
  ➜ "TRACK" – to repeat shuffling the current track.
  ➜ "ALL DISC" – to repeat shuffling all available discs.
- **In programme shuffled playback**
  ➜ "TRACK" – to repeat shuffling the current programmed track.
  ➜ "PROGRAM" – to repeat shuffling all programmed tracks.

Note:
– Pressing any disc OPEN•CLOSE button will cancel shuffle mode.

For Recording, please refer to "Tape Operation/Recording".



Storing Preset Radio Stations

You can store up to 40 preset radio stations in the memory.

Automatic Preset Programming

- Plug and Play setting (refer to "Basic Functions - Plug and Play").

OR

1 Press **TUNER** to select TUNER mode.
➜ "TUNER" will be displayed. A few seconds later, the current radio frequency will appear on the display.
➜ If a FM station is received in stereo, ∞ will appear on the display.

To begin automatic preset from a desired preset number

- Press I◀ or ▶I to select the desired preset number.
➜ For those radio stations that had been stored in one of the preset will not be restored again to another preset number.

2 Press and hold **PROG** until "AUTO" appears on the display.
➜ **PROGRAM** will start flashing.
➜ The system will search for all RDS stations and then continue with radio stations on FM, MW and LW band respectively.
➜ All available radio stations with sufficient signal strength will be stored automatically.
➜ The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
➜ The last preset radio station or the first available RDS station will then be played when completed.

To stop storing the automatic preset

- Press **PROG** or ■ on the system.

Note:
– If no preset number is selected, automatic preset will begin from preset (1) and all your former presets will be overridden.

Manual Preset Programming

1 Press **TUNER** repeatedly to select the desired waveband : FM, MW or LW.

2 Press **PROG**.
➜ **PROGRAM** will start flashing.
➜ The next available preset number will be displayed for selection.

3 Press and hold ◀◀ or ▶▶ until the frequency indication starts to change, then release.
➜ The display will show "SEARCH" until a radio station with sufficient signal strength is found.

To store the radio station to another preset number

- Press I◀ or ▶I to select the desired preset number.

4 Press **PROG** again to store the radio station.
➜ **PROGRAM** will disappear from the display.

- Repeat ***steps 2–4*** to store other preset radio stations.

Tuning to a weak radio station

- Press ◀◀ or ▶▶ briefly and repeatedly until the optimal reception is found.

To stop storing the manual preset

- Press ■ on the system.

Notes:
– If you attempt to store more than 40 preset radio stations, "PROGRAM FULL" will be displayed.
– During programming, if no key is pressed within 20 seconds, the system will exit the Programme mode automatically.

Tuning to Preset Radio Stations

- Once you've preset the radio stations, press I◀ or ▶I to select the desired preset number.
➜ The preset number, radio frequency, and waveband will appear on the display.

Erasing a Preset Radio Station

1 Press I◀ or ▶I to select the preset radio station to be erased.

2 Press and hold ■ on the system until "PRESET DELETED" appears on the display.
➜ The radio frequency remain on the display.
➜ The preset numbers of all other preset radio stations in the band with higher numbers are also decreased by one.

- Repeat ***steps 1–2*** to erase other preset radio stations.

For Recording, please refer to "Tape Operation/Recording".

RDS

RDS (Radio Data System) is a broadcasting service that allows FM stations to send additional information along with the regular FM radio signal. This additional information can contain:

STATION NAME: The radio station name is displayed.
PROGRAMME TYPE: The following programme types exist and can be received by your tuner: News, Affairs, Info, Sport, Educate, Drama, Culture, Science, Varied, Pop M, Rock M, M.O.R. (middle of the road music), Light M, Classics, Other M, No type.
RADIO TEXT (RT): text messages appear on the display.

Receiving RDS Radio Station

- Tuned to a radio station from FM band.
➜ If the radio station transmitting RDS signal, the RDS logo (**R·D·S**) and the radio station name will appear on the display.

To check the RDS information

- Press **RDS** on the remote control repeatedly to scroll through the following information (if available) : STATION NAME ➝ PROGRAMME TYPE ➝ RADIO TEXT ➝ TUNED FREQUENCY ➝ STATION NAME ....

Notes:
– If the tuned radio station does not transmit RDS signal or is a non RDS station, "NO RDS" will be displayed.
– If the RDS text message is not available at the RDS station, "NO RDS TEXT" will be displayed.

RDS Time

Some RDS station may be transmitting a real clock time at an interval of every minute.

Setting the RDS time

1 Press and hold **CLOCK** on the remote control.
➜ "00:00" or current time starts flashing.

2 Press **RDS** on the remote control.
➜ "SEARCH RDS TIME" will be displayed.
➜ When RDS time is read, "RDS TIME" will be displayed. The current time will be displayed for 2 seconds and stored automatically.
➜ If the RDS station does not transmit RDS time within 90 seconds, "NO RDS TIME" will be displayed.

Radio Reception

Note:
– Some RDS station may be transmitting a real time clock at a minute interval. The accuracy of the transmitted time depends on the transmitting RDS station.

NEWS *(only available in RDS radio station)*

Once the News PTY (Programme Type) is detected in a RDS station, it will switch to TUNER mode automatically.

IMPORTANT!
You can activate NEWS function in Standby, Demonstration or any source mode except Tuner and Eco Power Standby mode.

To start NEWS function

1 Press **NEWS** on the remote control.
➜ "NEWS" and NEWS logo (NEWS) will appear on the display.
➜ It will scan the radio stations stored in the first 5 preset and wait for the News Programme Type data to be available in any of these RDS radio stations.

● If no RDS station is detected in the first 5 presets, the system will exit NEWS function.
➜ "NO RDS NEWS" will be displayed and NEWS will disappear from the display.

2 When NEWS transmission is detected, the system will switch to Tuner mode automatically.
➜ NEWS will start flashing.

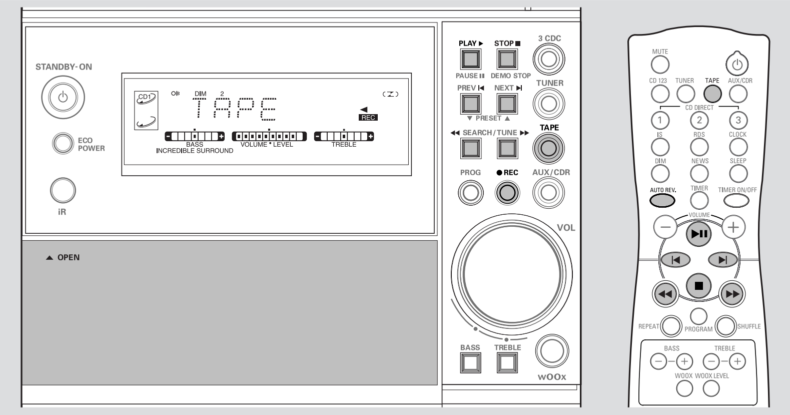
● At the end of news bulletin, the syetem will switch to the last selected source and resume its last operation (for example, before detecting the transmission, the system is playing track 5 of disc 1, it will resume playback from the same position).

Notes:
– You have to exit Tuner mode before selecting NEWS function.
– While searching NEWS in progress, the current source activity will remain uninterrupted.
– Before you activate the NEWS feature, ensure that the first 5 presets have RDS stations.
– The NEWS works only once for each activation.
– The NEWS will not start if a recording is in progress.

To cancel NEWS function

● Press **NEWS** again or press **TUNER** to select tuner mode.
● During news bulletin, press any other available source keys to execute the relevant source mode.

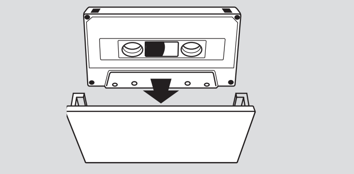
Tape Operation/Recording



IMPORTANT!
– Before playing a tape, check and tighten slack tape with a pencil. Slack tape may get jammed or may burst in the mechanism.
– C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.
– Store the tapes at room temperature and do not put them too close to a magnetic field (for example, a transformer, TV or speaker).

Tape Playback

1 Press **TAPE** to select tape mode.
2 Press ▲ **OPEN** to open the tape deck door.
3 Insert a recorded tape and close the tape door.
● Load the tape with the open side down and the full spool to the left.



4 Press **PLAY ▶ (▶II)** to start playback.
➜ "TAPE" with playback direction indicator will appear on the display.

To stop playback

● Press ■.

To change the playback side

● Press |◀ or ▶|.
➜ The ◀ (BACK) or ▶ (FRONT) appear on the display, depending on the tape side selected.

To change the playback mode

● Press **AUTO REV.** on the remote control repeatedly to select the different playback modes.
⊐ : playback on one side of the tape only.
⊃ : both sides are played once.
⊂⊃ : both sides are played repeatedly, up to 10 times each side unless you press ■.

To rewind or fast forward during playback

● Press and hold ◀◀ or ▶▶ until the desired passage is reached, then release.
➜ The tape continues playing.
● The tape will stop automatically at the end of the rewinding or fast forwarding.
➜ During searching, the sound is reduced to a low volume.

To rewind or fast forward when playback is stopped

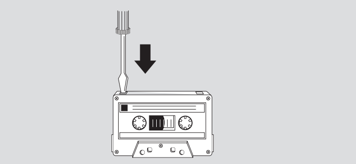
1 Press ◀◀ or ▶▶.
2 Press ■ when you reached the desired passage.

Tape Operation/Recording

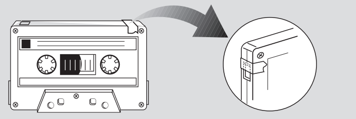
Note:
– During rewinding or fast forwarding of a tape, it is also possible to select another source (CD, TUNER or AUX, for example).

General Information on Recording

- For recording, use only tape of IEC type I (normal tape) or IEC type II (CrO_2).
- The recording level is set automatically, regardless of the position of the Volume, Incredible Surround, BASS/TREBLE, and so forth.
- The tape is secured at both ends with leader tape. At the beginning and end of the tape, nothing will be recorded for six to seven seconds.
- To prevent accidental recording, break out the tab on the left shoulder of the tape side you want to protect.



- If "CHECK TAPE" is displayed, the protection tab has been broken. Put a piece of clear adhesive tape over the opening. Do not cover the CrO_2 tape detection hole when covering the tab opening.



IMPORTANT!
Recording is permissible if copyright or other rights of third parties are not infringed upon.

Preparation for Recording

1 Press **TAPE** to select tape mode.
2 Load a recordable tape into the tape deck.
3 Press ⏮ or ⏭ to select the recording tape side.
➜ ◀ appears on the display for the reverse side.
➜ ▶ appears on the display for the forward side.
4 Press **AUTO REV.** on the remote control repeatedly to select a recording mode.
➜ ⊐ for recording on one side only.
➜ ⊃ for recording on both sides.
5 Prepare the source to be recorded.
3CDC – load the disc(s).
TUNER – tune to the desired radio station.
AUX – connect external equipment.

When recording is in progress
➜ REC starts flashing.
- It is not possible to change tape side.
- It is not possible to listen to another source.
- It is not possible to activate the timer function.

One Touch Recording

1 Press **3CDC**, **TUNER** or **AUX** to select the source.
2 Start playback of the selected source.
3 Press ● **REC** to start recording.

To stop recording
- Press ■ on the system.

Note:
– One Touch Recording is not possible in TAPE mode, "SELECT SOURCE" will be displayed.

Tape Operation/Recording

CD Synchro Recording

1 Press **3CDC** to select the disc.
- Press ⏮ or ⏭ to select the desired track to start recording.
- You can programme the tracks in the order you want them to be recorded (refer to "CD Operation - Programming the disc tracks").

2 Press ● **REC** to start recording.
➜ The disc will start playback automatically.

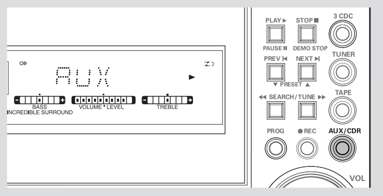
To select another track during recording
1 Press **PAUSE II (▶II)** to interrupt recording.
2 Press ⏮ or ⏭ to select the desired track.
3 Press **PLAY ▶ (▶II)** to resume recording.

To stop recording
- Press ■.
➜ Recording and disc playback will stop simultaneously.

Digital Recording via Digital Out

For CD digital recording, please refer to the instruction manuals for the CD recorder, digital audio equipment and so forth.

External Sources

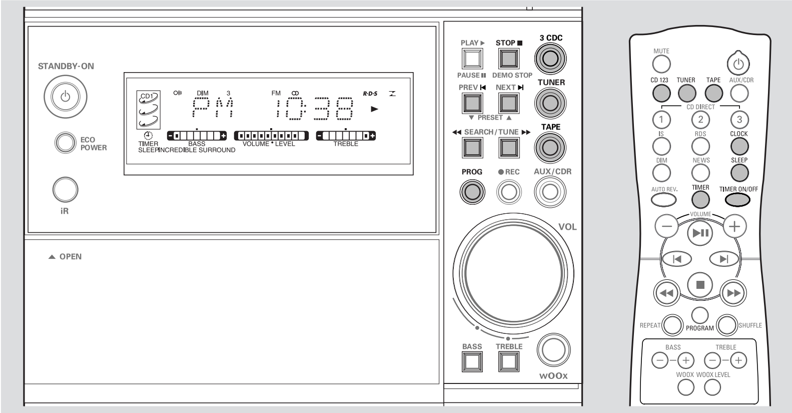


Listening to External Sources

1 Connect the audio out terminals of the external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder) to the AUX/CDR IN terminals of your system.
2 Press **AUX/CDR** repeatedly to select CDR mode or normal AUX mode.
➜ "CDR" or "AUX" will be displayed.
- If the sound from the external source is distorted, select CDR mode for listening.

Notes:
– You are advised not to listen to and record from the same source simultaneously.
– All the interactive sound control features (IS or BASS/TREBLE, for example) are available for selection.
– Refer to the operating instructions for the connected equipment for details.

For Recording, please refer to "Tape Operation/Recording".



IMPORTANT!
When in Eco Power Standby mode, it is not possible to operate clock or timer function.

Clock Setting

The clock can be set in either 12-hour or 24-hour mode ("AM 12:00" or "00:00" for example)

1 Press and hold **CLOCK** on the remote control until the time flashing on the display.

2 Press **PROG** on the system repeatedly to select clock mode.
➜ If 12-hour mode is selected, "AM XX:XX" will start flashing.
➜ If 24-hour mode is selected, "XX:XX" will start flashing.

3 Press ◀◀ or ▶▶ on the system repeatedly to set the hour.

4 Press |◀ or ▶| on the system repeatedly to set the minute.

5 Press **CLOCK** again to store the setting.
➜ The clock will start working.

To exit without storing the setting

- Press ■ on the system.

Notes:
– The clock setting will be cancelled when the power cord is disconnected or if a power failure occurs.
– During clock setting, if no key is pressed within 90 seconds, the system will exit clock setting mode automatically.
– To set the clock automatically through the time information in the RDS signal, refer to "Radio Reception - RDS Time".

Display Clock

The system allows you to select clock display or normal display in any source mode (except Eco Power Standby mode). When in Standby mode, the clock will automatically be displayed.

- Press **CLOCK** on the remote control repeatedly to select clock display or normal display mode.
➜ When in clock display mode, clock will be displayed. If the clock has not been set, "- - : - -" will appear on the display.

Note:
– If you pressed any keys during clock display mode, the display will briefly show the information related to the selected mode.

Timer Setting

The system can switch on to CD, TUNER, or TAPE mode automatically at a preset time, serving as an alarm to wake you up.

IMPORTANT!
– Before setting the timer, ensure that the clock is set correctly.
– The timer will always be switched on after it has been set.
– The timer will not start if a recording is in progress.
– The volume of the timer will increase gradually from the minimum level until it reaches the last tuned volume level.

1 Press and hold **TIMER** on the remote control for more than **two seconds**.
➜ "AM 12:00" or "00:00" or the last timer setting will start flashing.
➜ **TIMER** ⏲ will start flashing.
➜ The selected source will be lighted while other available sources are flashing.

2 Press **3CDC**, **TUNER** or **TAPE** to select the desired source.

- Before setting timer, make sure the music source has been prepared.
3CDC – Load the disc(s). To start from a specific track, make a programme (refer to "CD Operation - Programming the disc tracks").
TUNER – tune to the desired radio station.
TAPE – load a prerecorded tape.

3 Press ◀◀ or ▶▶ on the system repeatedly to set the hour for the timer to start.

4 Press |◀ or ▶| on the system repeatedly to set the minute for the timer to start.

5 Press **TIMER** to store the start time.
➜ "TIMER ON" will be displayed and followed by the set timer "XX:XX" and then the selected source.
➜ **TIMER** ⏲ will remain on the display.

- At the preset time, the selected source will play.

To exit without storing the setting

- Press ■ on the system.

Notes:
– If the selected source (CD) is not available when preset timer is reached, TUNER will be selected automatically.
– During timer setting, if no key is pressed within 90 seconds, the system will exit timer setting mode automatically.

To check the TIMER

- Press **TIMER** on the remote control.
➜ If the timer has been activated, the set timer information will be displayed.
➜ If the timer has been deactivated, "OFF" will be displayed.

To activate/deactivate the TIMER

- Press **TIMER ON/OFF** repeatedly on the remote control.
➜ If activated, the last set timer information will be shown for a few seconds and **TIMER** ⏲ will appear on the display.
➜ If deactivated, "OFF" will be displayed.

Sleep Timer Setting

The sleep timer enables the system to switch to Standby mode automatically at a preset time.

1 Press **SLEEP** on the remote control repeatedly to select a preset time.
➜ The selections are as follows (time in minutes):
15 → 30 → 45 → 60 → OFF → 15 …
➜ "SLEEP XX" or "OFF" will be displayed. "XX" is the time in minutes.

2 When you reach the desired length of time, stop pressing the **SLEEP** button.
➜ **SLEEP** will appear on the display, except for "OFF" mode.
➜ The Sleep Timer is now set. Before the system switches to standby mode, a countdown of 10 seconds will be displayed.
"SLEEP 10" → "SLEEP 9".... →
"SLEEP 1" → "SLEEP"

While SLEEP mode is activated

To check the remaining length of time

- Press **SLEEP once**.

To change the preset sleep timer

- Press **SLEEP twice**.
➜ The display will show the remaining time followed by the sequence of sleep timer options.

To deactivate the Sleep Timer

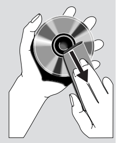
- Press **SLEEP** repeatedly until "OFF" is displayed, or press the **STANDBY ON** button.

Maintenance

Cleaning the Cabinet

- Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

Cleaning Discs



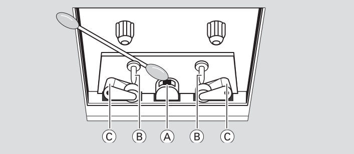
- When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the centre out. Do not wipe in a circular motion.
- Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analogue records.

Cleaning the disc lens

- After prolonged use, dirt or dust may accumulate at the disc lens. To ensure good playback quality, clean the disc lens with Philips CD Lens Cleaner or any commercially available cleaner. Follow the instructions supplied with the cleaner.

Cleaning the Heads and the Tape Paths

- To ensure good recording and playback quality, clean the heads Ⓐ, the capstan(s) Ⓑ, and pressure roller(s) Ⓒ after every 50 hours of tape operation.
- Use a cotton swab slightly moistened with cleaning fluid or alcohol.
- You also can clean the heads by playing a cleaning tape once.



Demagnetising the heads

- Use a demagnetising tape available at your dealer.

Troubleshooting

WARNING
Under no circumstances should you try to repair the system yourself, as this will invalidate the warranty. Do not open the system as there is a risk of electric shock.

If a fault occurs, first check the points listed below before taking the system for repair. If you are unable to remedy a problem by following these hints, consult your dealer or service centre.

Problem	Solution
CD OPERATION	
"`NO DISC`" **is displayed.**	– Insert a disc. – Check if the disc is inserted upside down. – Wait until the moisture condensation at the lens has cleared. – Replace or clean the disc, see "Maintenance".
"`DISC NOT FINALIZED`" **is displayed.**	– Use a finalised CD-R(W) or CD-R.

RADIO RECEPTION	
Radio reception is poor.	– If the signal is too weak, adjust the antenna or connect an external antenna for better reception. – Increase the distance between the Mini HiFi System and your TV or VCR.
TAPE OPERATION/RECORDING	
Recording or playback cannot be made.	– Clean deck parts, see "Maintenance". – Use only NORMAL (IEC I) or IEC type II (Cr0$_2$) tape. – Apply a piece of adhesive tape over the missing tab space.
The tape deck door cannot open.	– Remove and reconnect the AC power plug and switch on the system again.
GENERAL	
The system does not react when buttons are pressed.	– Remove and reconnect the AC power plug and switch on the system again.
Sound cannot be heard or is of poor quality.	– Adjust the volume. – Disconnect the headphones. – Check that the speakers are connected correctly. – Check if the stripped speaker wire is clamped.
The left and right sound outputs are reversed.	– Check the speaker connections and location.
The remote control does not function properly.	– Select the source (CD or TUNER, for example) before pressing the function button (▶, ⏮, ⏭). – Reduce the distance between the remote control and the system. – Insert the batteries with their polarities (+/– signs) aligned as indicated. – Replace the batteries. – Point the remote control in the direction of the system's IR sensor.
The timer is not working.	– Set the clock correctly. – Press TIMER ON/OFF to switch on the timer. – If recording is in progress, stop recording.
Not all lighted buttons are showing light.	– Press DIM to select DIM OFF display mode.
The Clock/Timer setting is erased.	– Power has been interrupted or the power cord has been disconnected. Reset the clock/timer.
The system displays features automatically and buttons start flashing.	– Press and hold DEMO STOP on the system to switch off the demonstration.

Preparations

Ⓐ **Power**

Before connecting the AC power cord to the wall outlet, ensure that the following are done;

– If your system is equipped with a Voltage Selector, set the VOLTAGE SELECTOR to the local power line voltage.

– All other connections have been made.

Controls (except /22 version)

⑲ **AUTO REV. (AUTO REVERSE)**
– to select the desired tape playback modes.

⑳ **TIMER**
– to display timer or set the timer.

㉑ **REPEAT**
– to playback track(s)/disc(s)/program repeatedly.

㉒ **SHUFFLE**
– to playback all available discs and their tracks/program in random order.

㉓ **TIMER ON/OFF**
– to activate or deactivate the timer function.

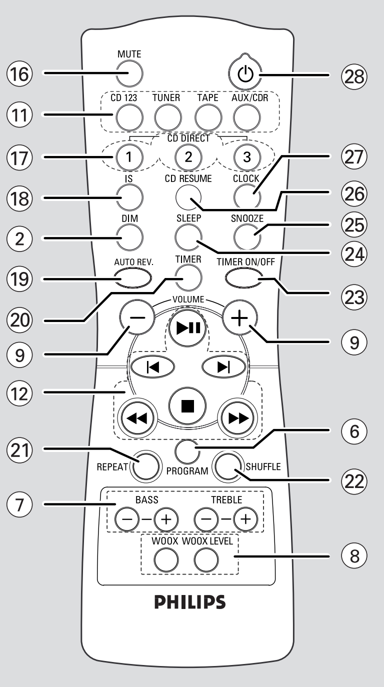
㉔ **SLEEP**
– to activate, deactivate or set the sleep timer function.

㉕ **SNOOZE**
– to temporarily deactivate the wake up timer.

㉖ **CD RESUME**
– to continue playback from the last selected track after an interruption (only when the CD source is still in the active mode).
– to resume the last selected CD mode.

㉗ **CLOCK**
– to display clock or set the clock.

㉘ ⏻
– to switch the system to Standby mode.



Notes for remote control:
– First, select the source you wish to control by pressing one of the source select keys on the remote control (CD 123 or TUNER, for example).
– Then select the desired function (▶, I◀, ▶I, for example).

CD Operation

Disc Playback

	a disc is loaded in the disc tray
CD1	the current selected disc tray is empty
CD1	the current selected disc tray is loaded
CD1	the disc tray is currently playing

To resume playback from the last selected track

- In CD stop or pause mode, press **CD RESUME** on the remote control to start playback again from where you have stopped.

Notes:
– Resume will not be available if you have changed the disc, opened the disc tray or disconnected the system the power supply.
– Select CD RESUME in any other source mode will only able to resume the last selected CD active mode (for example, CD stop or playback).

Radio Reception

Changing Tuning Grid *(available for /21/21M versions)*

In North and South America, the frequency step between adjacent channels in the MW band is 10 kHz (9 kHz in some areas). The preset frequency step in the factory is 9 kHz.

Changing the tuning grid will erase all previously stored preset radio stations.

1 Disconnect the system from the AC power supply (pull out the AC power cord).

2 While holding down **TUNER** and ▶▶ on the system, reconnect the system to the AC power supply.
➜ The display will show "GRID 9" or "GRID 10".

Notes:
– GRID 9 and GRID 10 indicate that the tuning grid is in step of 9 kHz and 10 kHz respectively.
– The FM tuning grid also will be changed from 50 kHz to 100 kHz or vice versa.

Clock/Timer

To activate/deactivate the TIMER

- Press **TIMER ON/OFF** repeatedly on the remote control.
  ➜ If activated, the last set timer information will be shown for a few seconds and **TIMER** ⏲ will appear on the display.
  ➜ If deactivated, "OFF" will be displayed.

To deactivate the wake up timer (five minutes interval)

- After timer wake up, press **SNOOZE** on the remote control.
  ➜ The system will switch to standby mode for five minutes. After then, it resumes the timer last selected source again.
- To cancel the snooze function, press **SNOOZE** again.

Note:
– To enable the snooze function, it should be done within 30 minutes after timer wake up.

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DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover

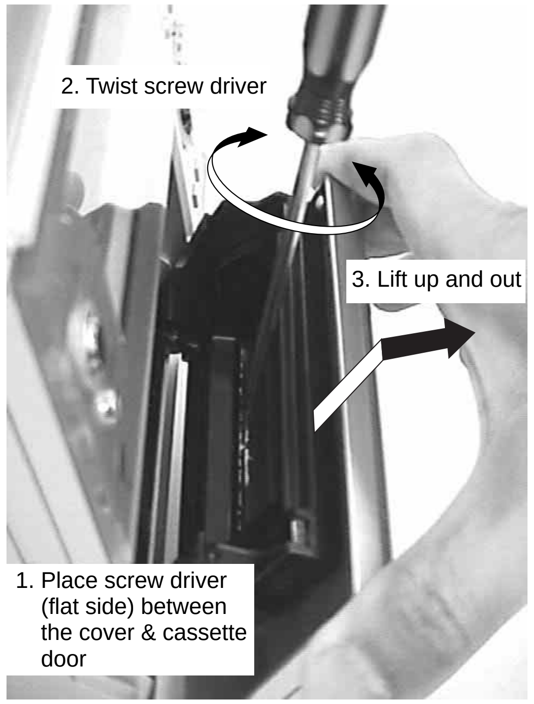

2. Twist screw driver
3. Lift up and out
1. Place screw driver (flat side) between the cover & cassette door

Figure 1 Remove Cassette Cover

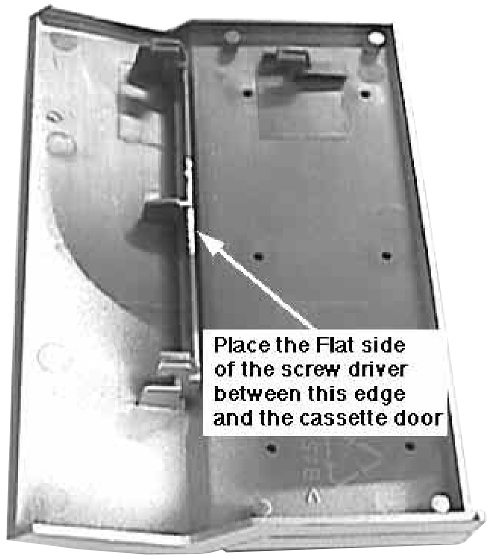

Place the Flat side of the screw driver between this edge and the cassette door

Figure 2 Cassette Cover

Dismantling of the 3DTC Module and Tuner Board

1) Loosen 4 screws and remove the Cover Top (pos 255) by sliding it out towards the rear before lifting up.
   - 2 screws on the rear
   - 1 screw each on the left & right side
2) Loosen 2 screws each to remove the Panel Left and Right (pos 253 & 254). The Panels are remove by sliding it towards the rear and outwards.
   - 1 screw on the side
   - 1 screw on the rear
3) Open the 3DTC Tray by sliding the lever (pos 36) as shown in figure 4 with the help of a flat head screw driver.
4) Remove the Cover Tray (pos 106) as shown in figure 3.
5) Loosen 4 screws A (see figure 4)to remove the 3DTC Module.
   - 2 screws on the front
   - 1 screw each on the left & right side
6) Loosen 3 screws E (see figure 8) on the Panel Rear (pos 256) & uncatch 2 catches C3 to remove the Tuner Board.

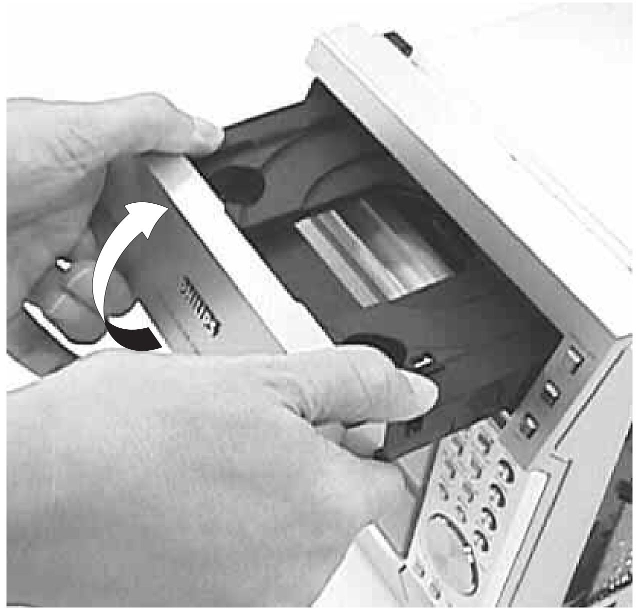


Figure 3

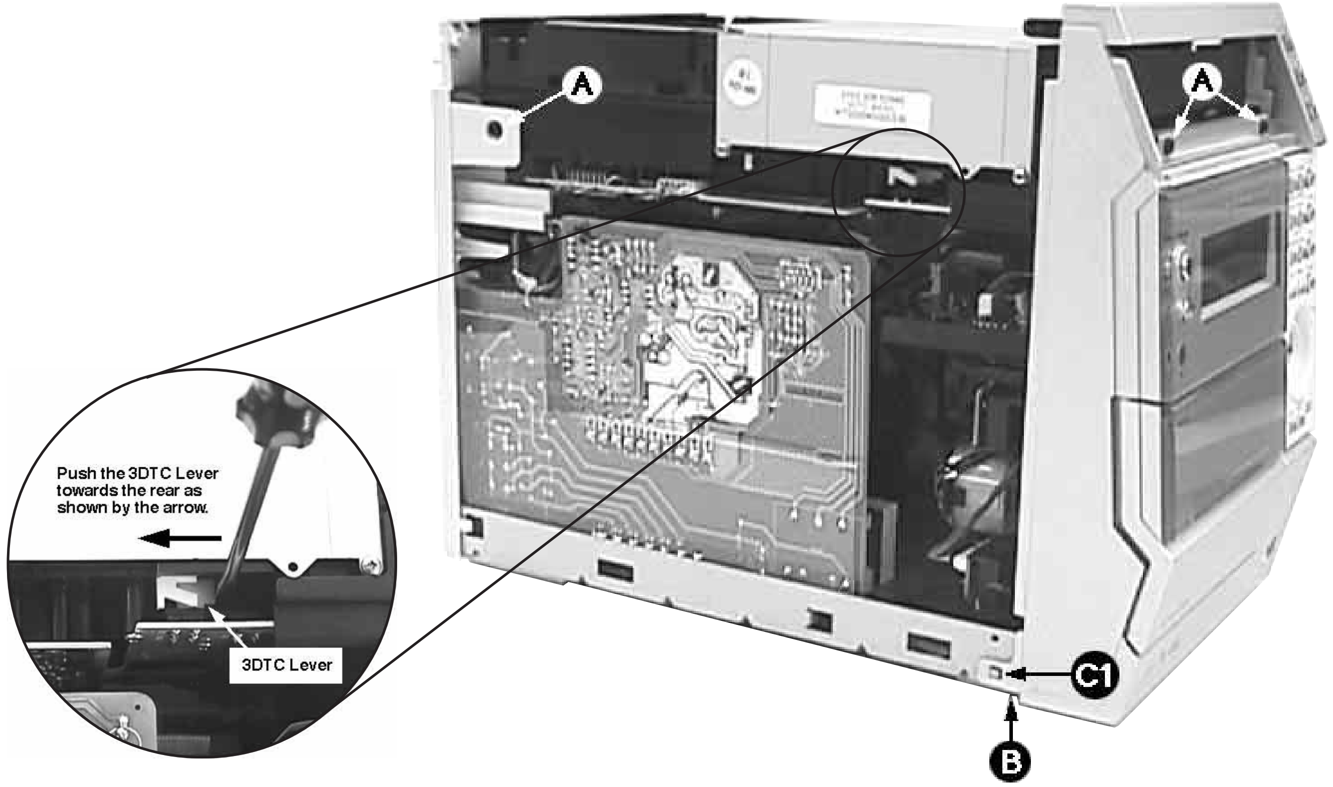

A
A
Push the 3DTC Lever towards the rear as shown by the arrow.
3DTC Lever
C1
B

Figure 4

Detaching the Front Panel assembly from the Bottom/Rear assembly

1) Remove 2 screws B (see figure 4) from the bottom of the Cabinet Front (pos 101).
2) Release the fixation of the Combi Board to Bracket Combi (pos 252) by releasing 2 catches C2 and pulling the board outwards as shown in figure 5.
3) Uncatch 2 catches C1 (see figure 4) on the left & right sides of Cabinet Front (pos 101) and slides the Front Panel assembly out towards the front.

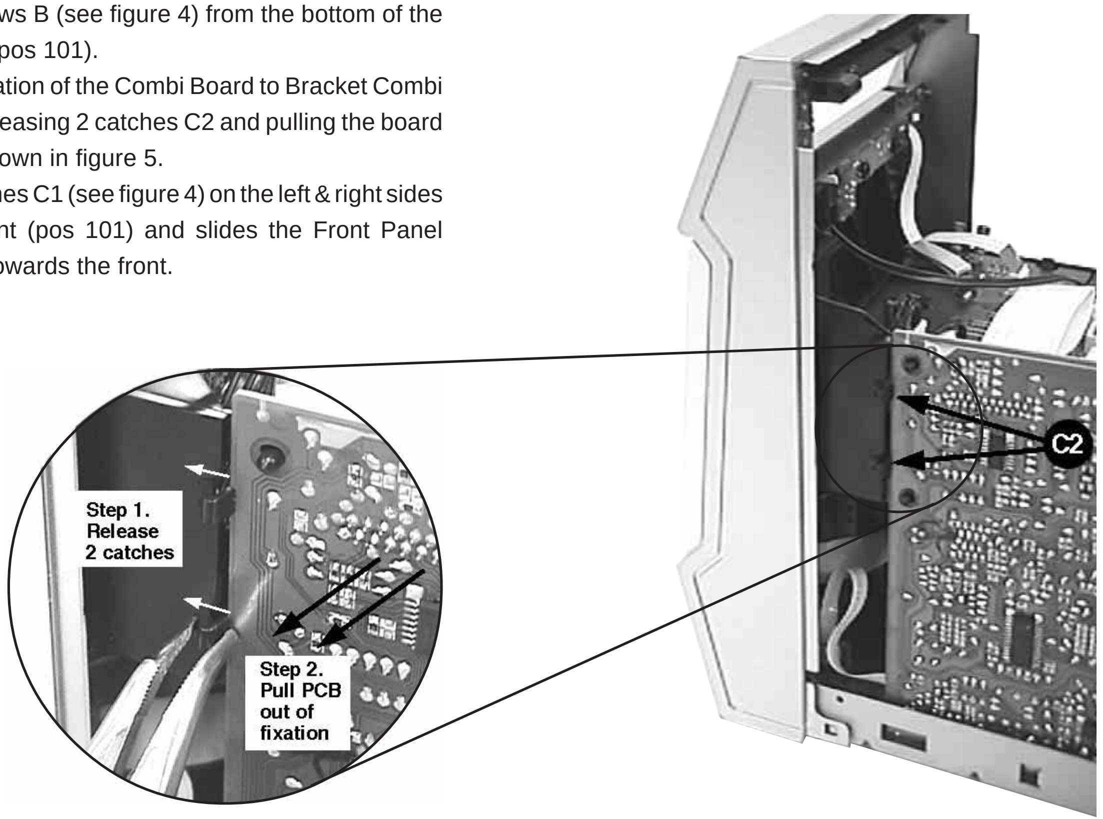

C2
Step 1. Release 2 catches
Step 2. Pull PCB out of fixation

Figure 5

Dismantling of the Front Panel assembly

1) Loosen 4 screws C in figure 7 to remove the ETF6-LE Module.
2) Insert a strong string into the slot between the Jog knob (pos 136) and Cover control (pos 137), looped it until it engage into both the U-slot of the Jog knob and pulled it out as shown in figure 6.
3) Loosen 4 screws D to remove the Display Board assembly.

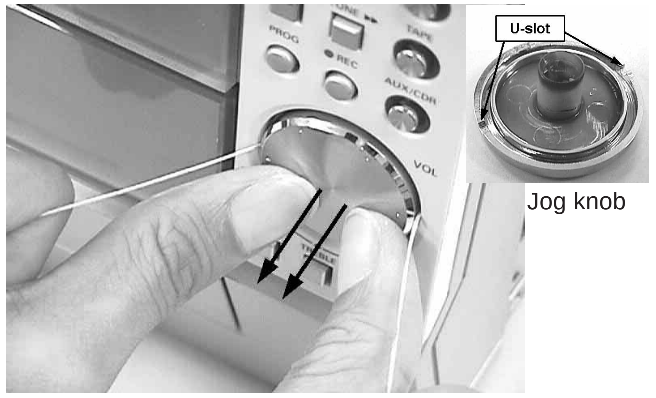

U-slot
Jog knob

Figure 6

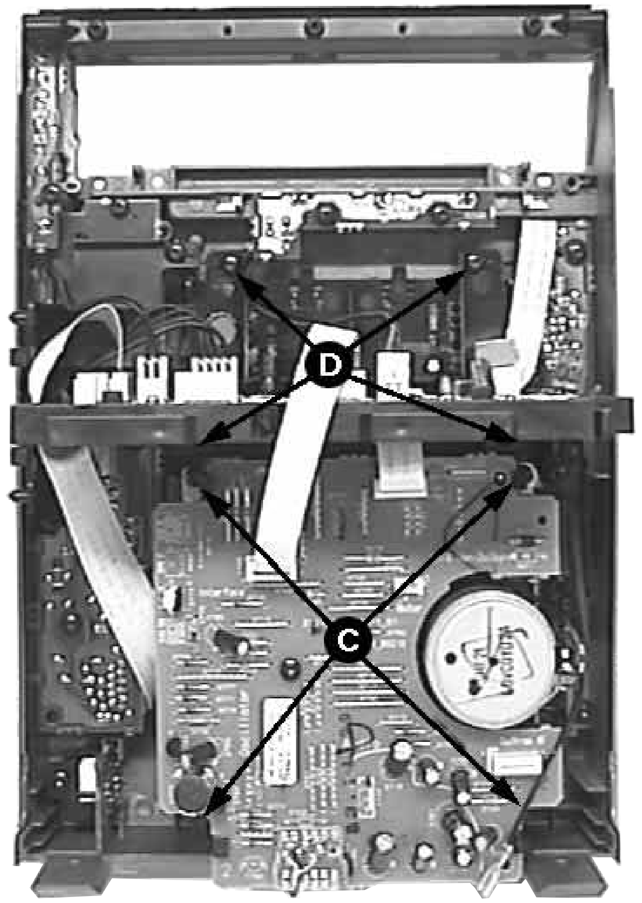


Figure 7

Dismantling of Rear Panel

1) Loosen 3 screws E and 2 catches C3 to remove the Tuner Board assembly.

   Note: Tuner Board assembly can also be remove together with the Panel Rear.
2) Loosen 1 screw F and the 2 catches C4 to free the Mains socket board from the Panel Rear (pos 256).
3) Loosen 6 screws G and 2 catches C5 to remove the Panel Rear (pos 256) by sliding it out towards the rear.

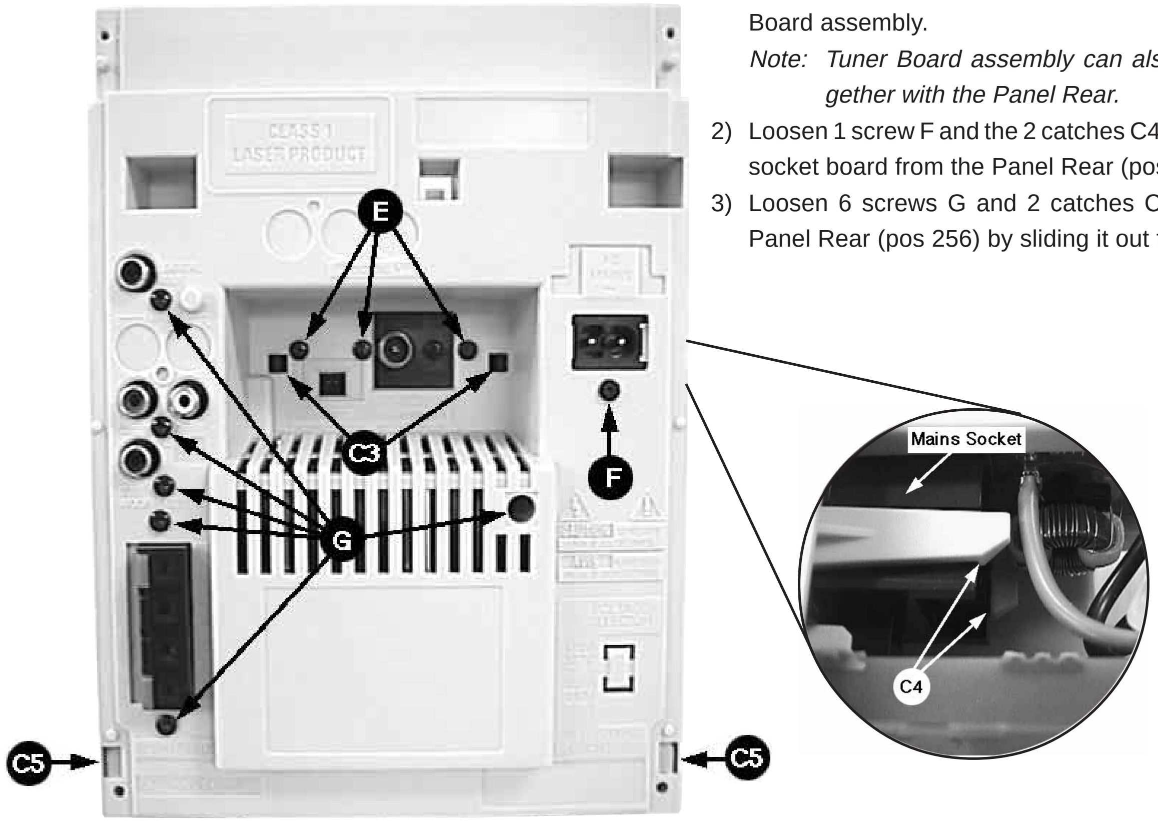

E
C3
F
G
C5
C5
Mains Socket
C4

Figure 8

Dismantling of the Bottom assembly

1) Loosen 2 screws H as shown in figure 9 to remove the Combi / Regulator boards assembly.
2) Loosen1 screws J and uncatch Shield Transformer (pos 269) from the Bottom plate (pos 265) as shown in figure 11 to remove it.
3) Loosen 4 screws K mounting the Mains Transformer (pos 5001) to remove the Mains Board & Transformer assembly.
4) Loosen 2 screws L to remove the Housing Fan top (pos 267).

Note: During Fan replacement care should be taken to ensure that the following are correct:
- *fan blades direction*
- *fan wire position*
- *fan is properly supported by the rubber damper*

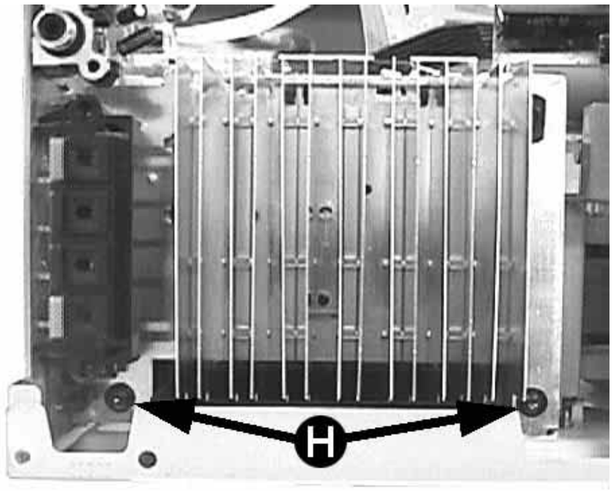


Figure 9

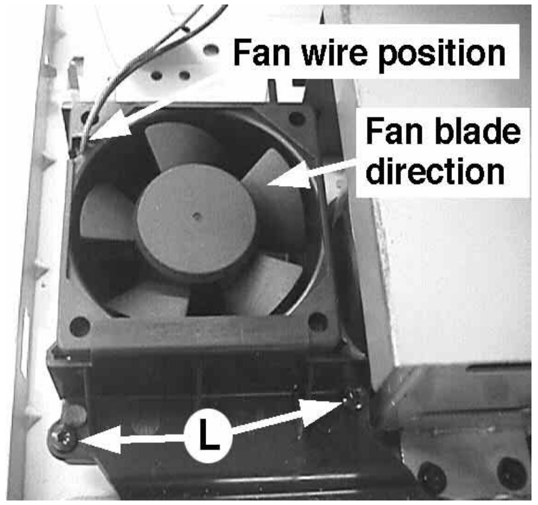

Fan wire position
Fan blade direction
L

Figure 10

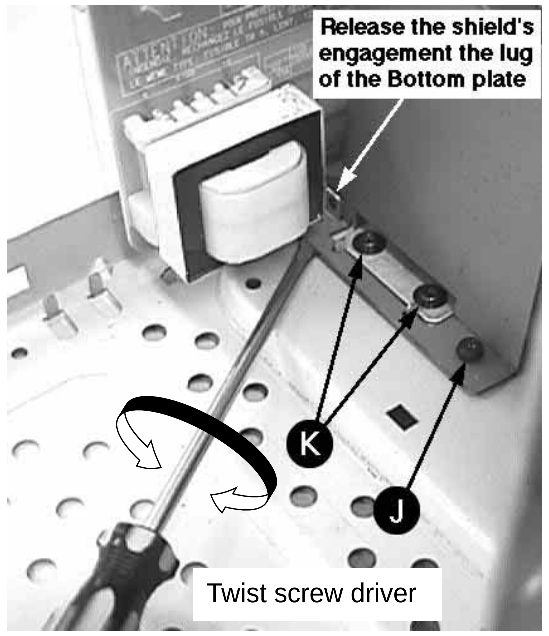

Release the shield's engagement the lug of the Bottom plate
K
J
Twist screw driver

Figure 11

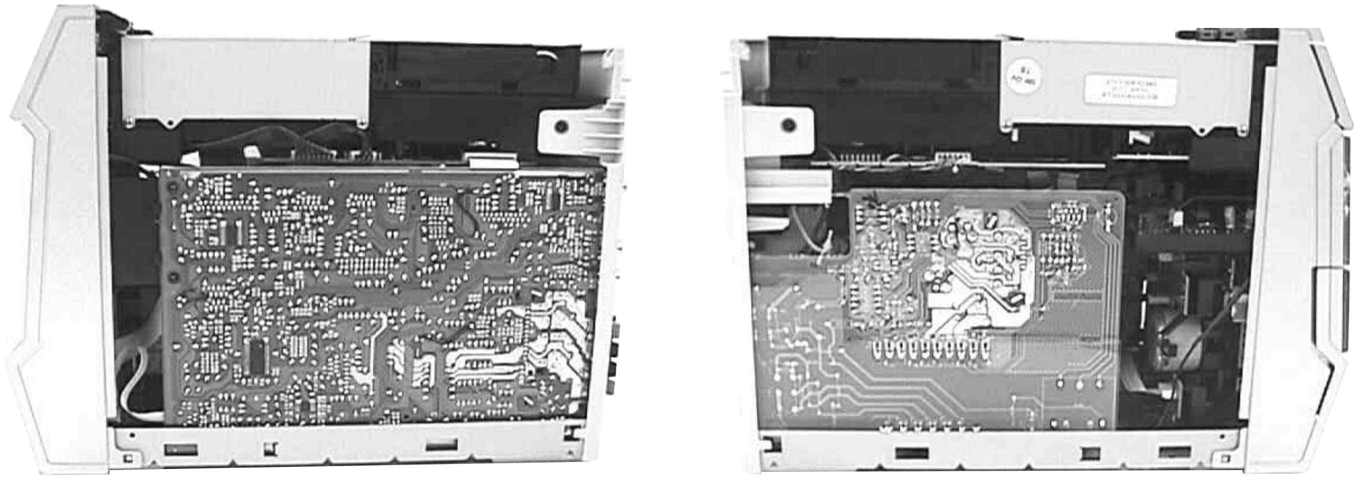
SERVICE POSITIONS & REPAIR HINTS

1) During repair it is possible to disconnect the ECO6 Tuner board, ETF6 Tape Module and/or CDC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.

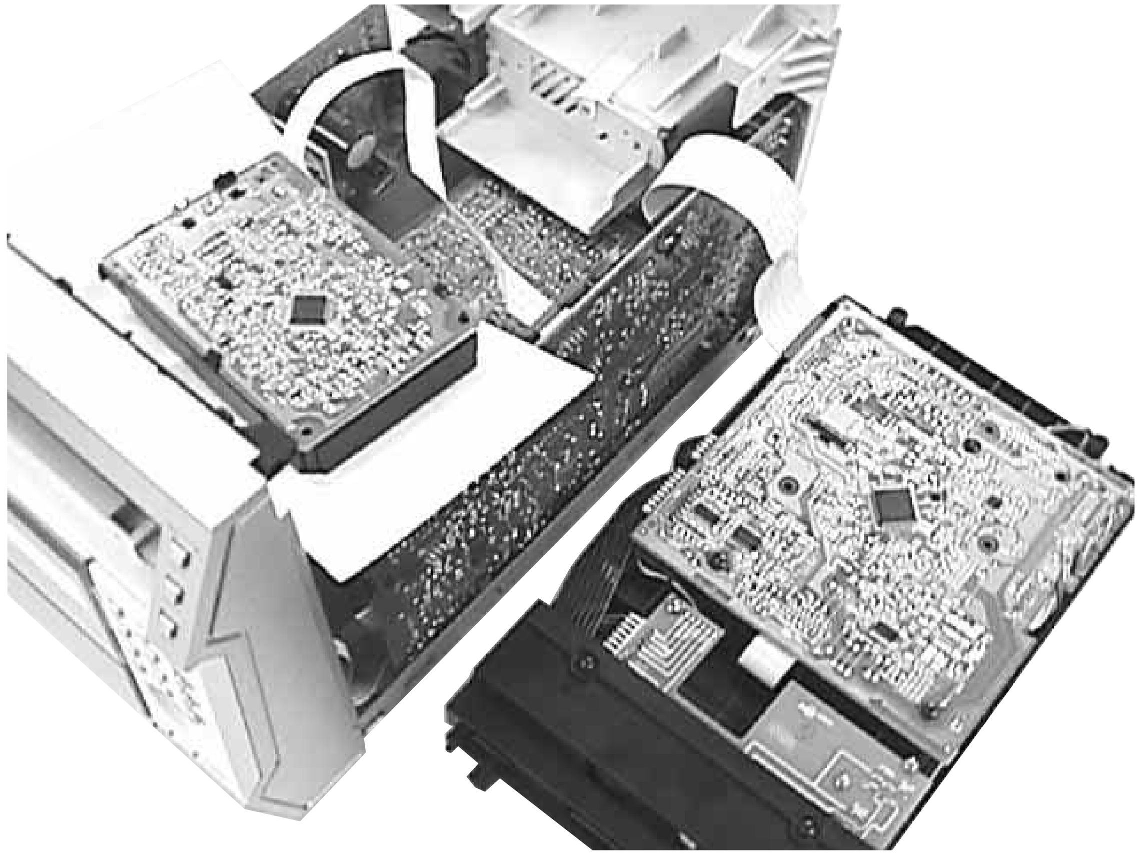
2) For Service position C (repair on the ETF6 Tape module), it is necessary to inter-change the flex wires for connector 1701 & 1706 because of wire length.

Note: The flex cables are very fragile, care should be taken not to damage them during repair. After repair, be very sure that the flex cables are inserted properly into the flex sockets before encasing, otherwise faults may occurs.

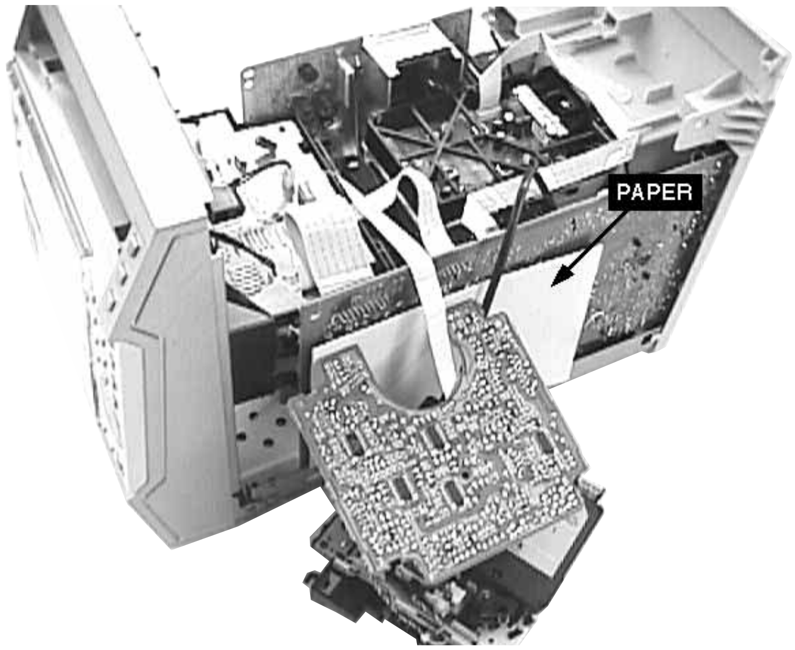
Service pos A



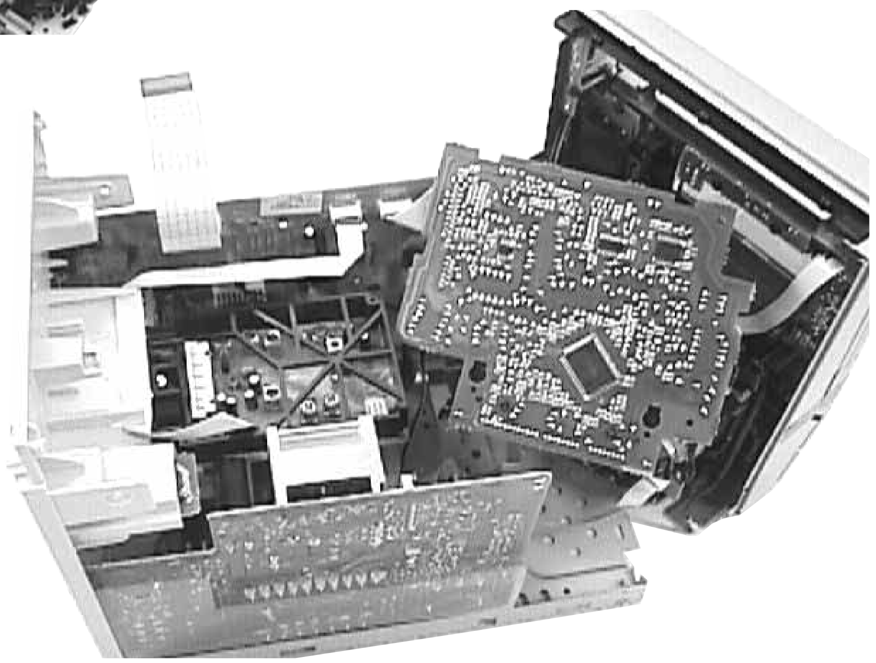
Service pos B



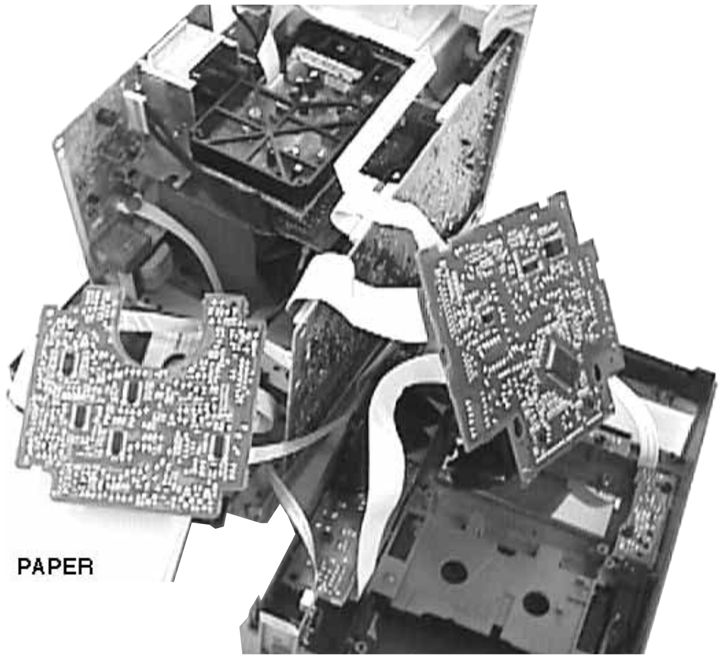
Service pos C



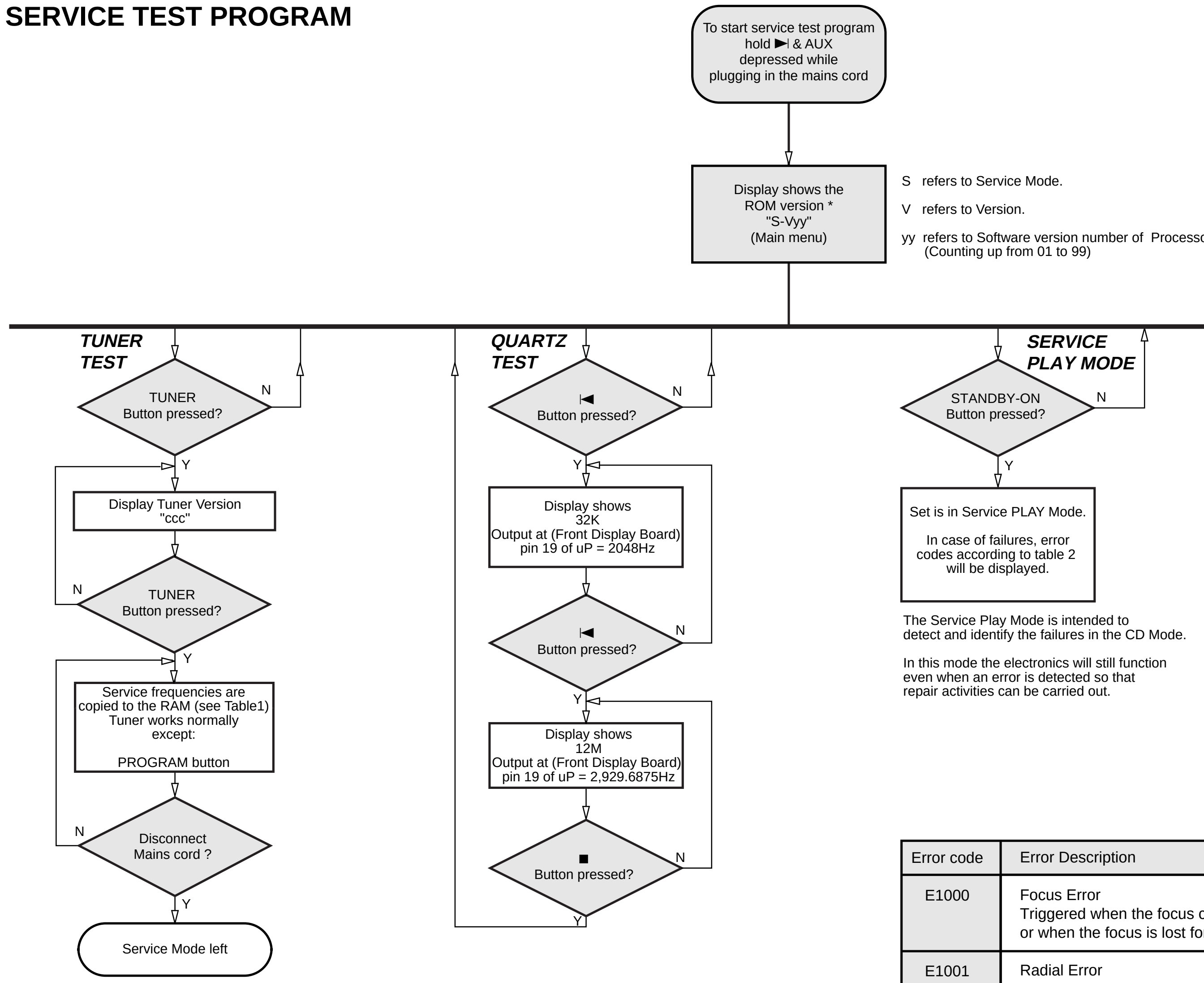
Service pos D



Service pos D



SERVICE TEST PROGRAM


To start service test program hold ►I & AUX depressed while plugging in the mains cord
Display shows the ROM version * "S-Vyy" (Main menu)
TUNER TEST
TUNER Button pressed?
N
Y
Display Tuner Version "ccc"
TUNER Button pressed?
N
Y
Service frequencies are copied to the RAM (see Table1) Tuner works normally except: PROGRAM button
Disconnect Mains cord ?
N
Y
Service Mode left
QUARTZ TEST
I◄ Button pressed?
N
Y
Display shows 32K Output at (Front Display Board) pin 19 of uP = 2048Hz
I◄ Button pressed?
N
Y
Display shows 12M Output at (Front Display Board) pin 19 of uP = 2,929.6875Hz
■ Button pressed?
N
Y
SERVICE PLAY MODE
STANDBY-ON Button pressed?
N
Y
Set is in Service PLAY Mode. In case of failures, error codes according to table 2 will be displayed.

S refers to Service Mode.

V refers to Version.

yy refers to Software version number of Processor. (Counting up from 01 to 99)

The Service Play Mode is intended to detect and identify the failures in the CD Mode.

In this mode the electronics will still function even when an error is detected so that repair activities can be carried out.

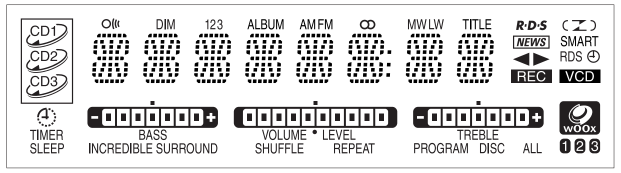
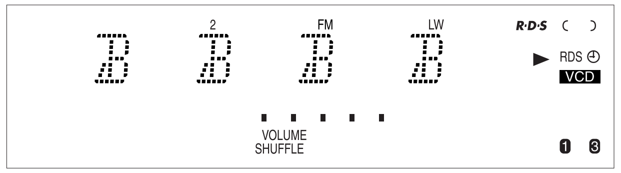
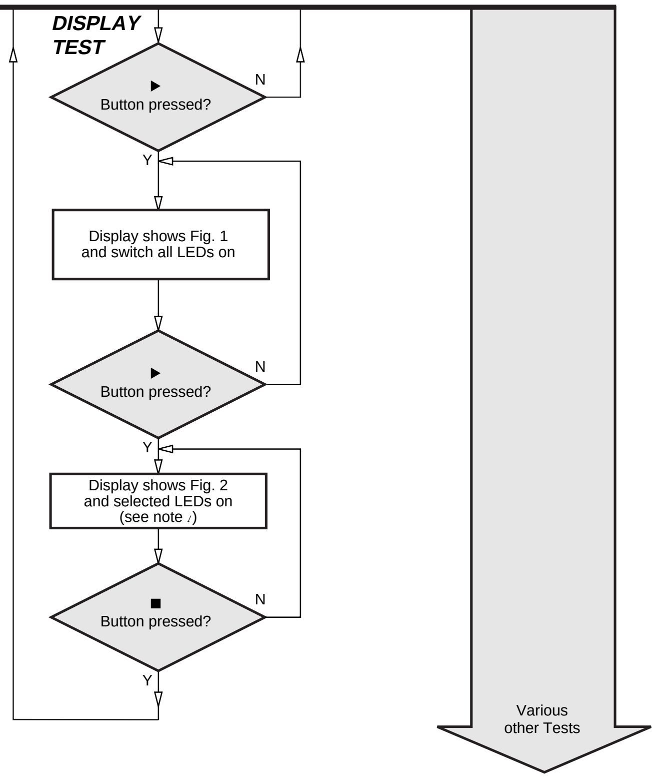

CD1
CD2
CD3
DIM
123
ALBUM
AM FM
MW LW
TITLE
R·D·S
NEWS
SMART
RDS
REC
VCD
TIMER
SLEEP
BASS
INCREDIBLE SURROUND
VOLUME
LEVEL
SHUFFLE
REPEAT
TREBLE
PROGRAM
DISC
ALL
wOOx
1 2 3

Figure 1


2
FM
LW
R·D·S
RDS
VCD
VOLUME
SHUFFLE
1 3

note *1* : 3CDC, TAPE and wOOx

Figure 2


DISPLAY TEST
► Button pressed?
N
Y
Display shows Fig. 1 and switch all LEDs on
► Button pressed?
N
Y
Display shows Fig. 2 and selected LEDs on (see note 1)
■ Button pressed?
N
Y
Various other Tests

PRESET	Europe "EUR"			USA "USA"	Oversea "OSE"
1	87.5MHz			87.5MHz	87.5MHz
2	108MHz			108MHz	108MHz
3	531kHz			530kHz	531/530kHz*
4	1602kHz			1700kHz	1602/1700kHz*
5	558kHz			560kHz	558/560kHz*
6	1494kHz			1500kHz	1494/1500kHz*
7	153kHz			98MHz	98MHz
8	279kHz			87.5MHz	87.5MHz
9	198kHz			87.5MHz	87.5MHz
10	98MHz			87.5MHz	87.5MHz
11	87.5MHz			87.5MHz	87.5MHz

Table 1

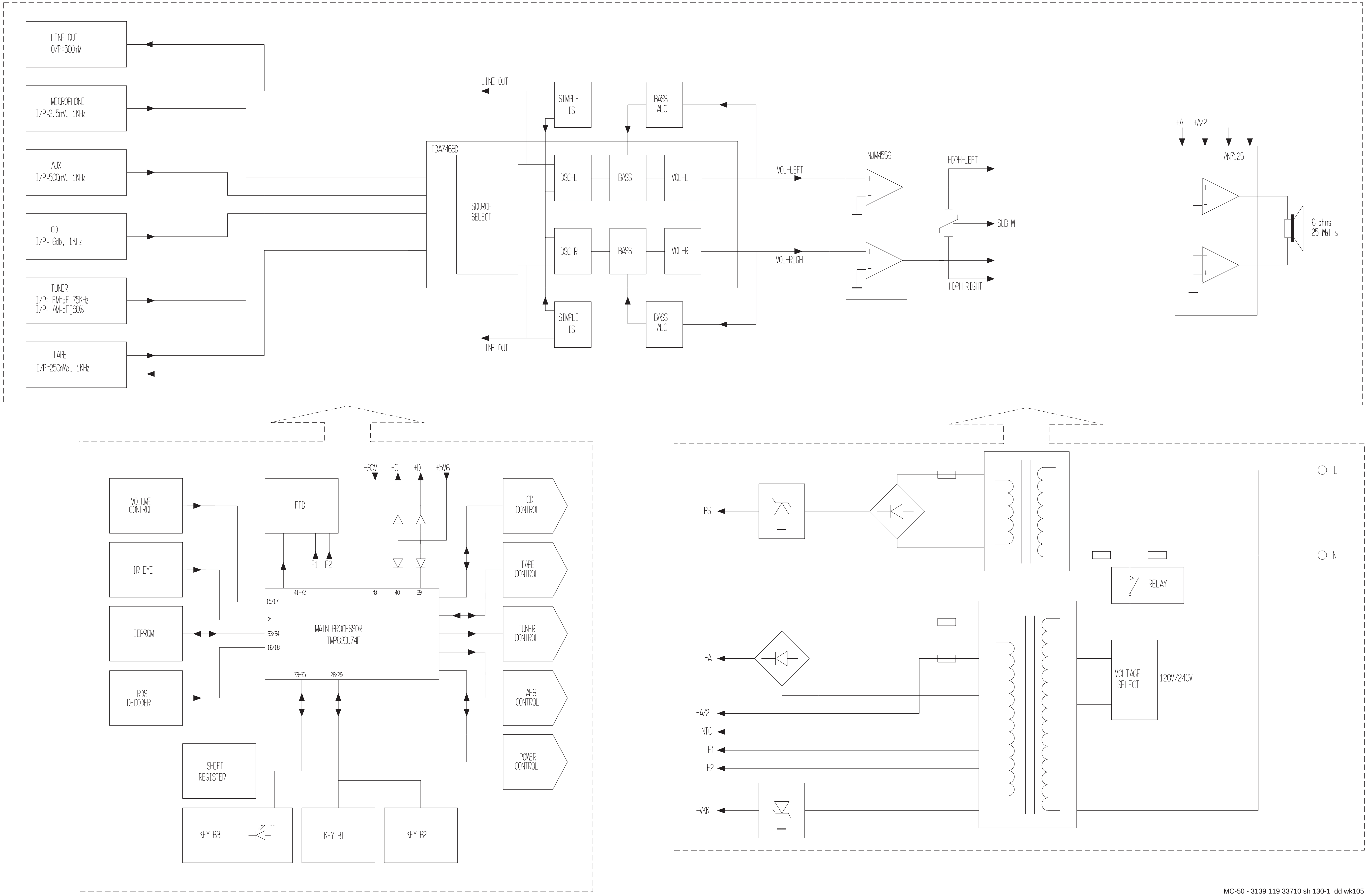
Note: * Depending on the selected grid frequency (9 or 10kHz)
By holding the TUNER and ►► buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:
- the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/21) version.

Error code	Error Description
E1000	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed by. Inner-switch or sledge motor problem.
E1003	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time.
E1006	Subcode Error Triggered when a new subcode was missing for a certain time during play.
E1007	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	Turntable Motor Error Generated when the CD could not reached 75% of speed during startup within a certain time. Disc motor problem.
E1020	Focus Search Error The focus point has not been found within a certain time.
E1031	The active lower carriage does not come to the end position within a certain time. This can happen when the switches are defective, or when the carriage is blocked in between two end positions (example: 2 disc in one carriage). The time-out is approximately 5 seconds.
E1061	The drawer could not enter the inside position and is opening again. This can happen if the drawer is blocked such that it cannot go fully inside, or if the drawer switch is defective and never closes.
E1071	The active upper carriage does not come to the end position within a certain time. This happen when the switches are defective, or when the carriage is blocked in between two end positions (example: 2 disc in one carriage)/ The time-out is approximately 5 Sec.
E1079	The drawer could not enter the outside position and is stopped at its blocked position. This can happen if the drawer is blocked such that it cannot go fully outside, or if the drawer switch is defective and never opens.

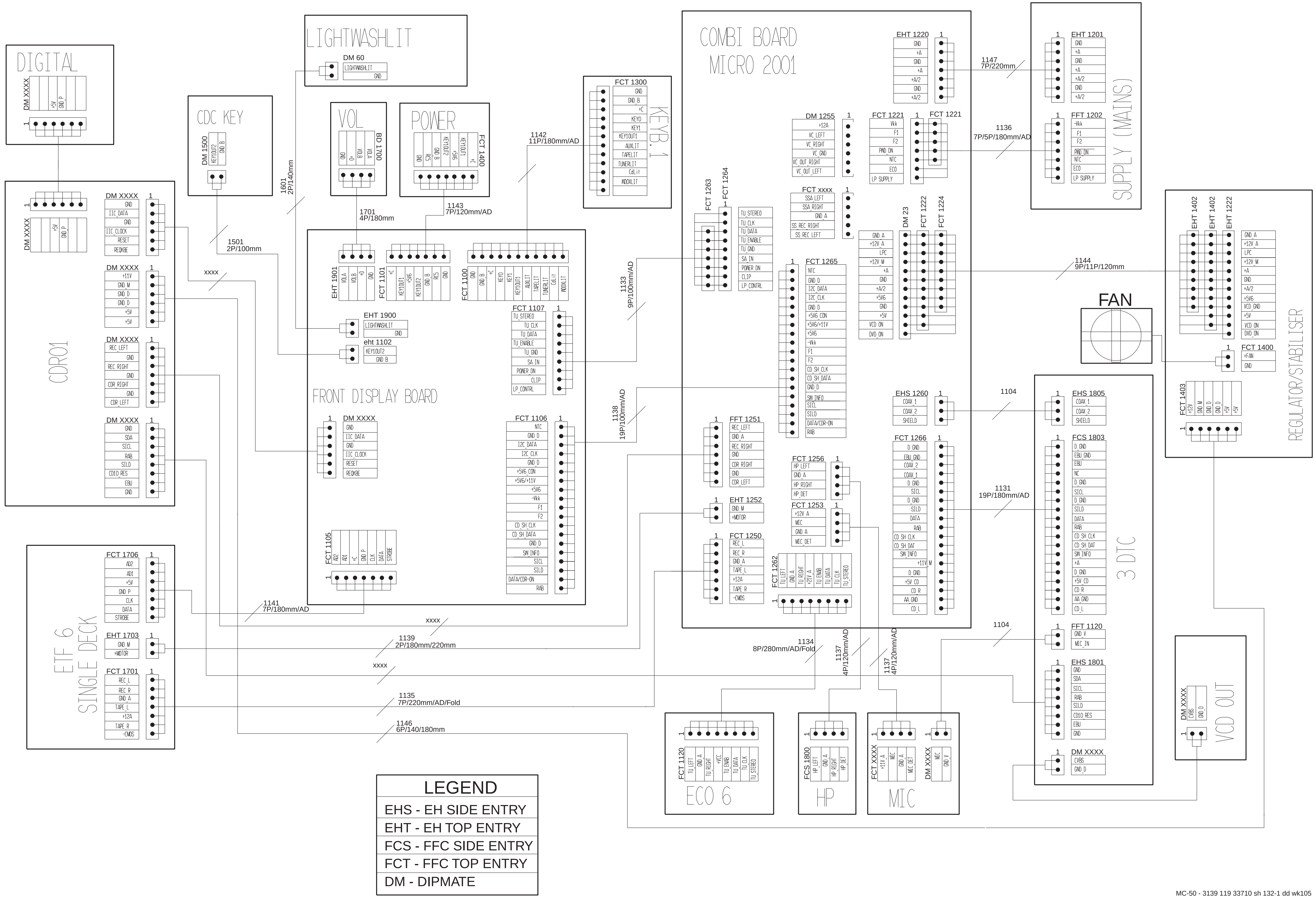
Table 2

TEST	***Activated with***	***ACTION***
EEPROM TEST	►► ■ to Exit	8 test patterns will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test patterns correctly, otherwise "ERROR" will be displayed.
EEPROM FORMAT	◄◄	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
ENCODER TEST	Volume Knob	Display shows value for 2 seconds. Values increases or decreases in steps of 1 dB until VOL MUTE (Min.) or 0dB (Max.) is reached.
DEMO MODE	Treble	Pressing this button will toggle between DEMO ON and DEMO OFF. The DEMO status will scroll once on the Display.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

SET BLOCK DIAGRAM


LINE OUT
O/P=500mV
MICROPHONE
I/P=2.5mV, 1KHz
AUX
I/P=500mV, 1KHz
CD
I/P=-6db, 1KHz
TUNER
I/P: FM=dF 75KHz
I/P: AM=dF 80%
TAPE
I/P=250nWb, 1KHz
LINE OUT
SIMPLE IS
BASS ALC
TDA7468D
SOURCE SELECT
DSC-L
BASS
VOL-L
DSC-R
BASS
VOL-R
SIMPLE IS
BASS ALC
LINE OUT
VOL-LEFT
VOL-RIGHT
NJM4556
HDPH-LEFT
SUB-W
HDPH-RIGHT
+A
+A/2
AN7125
6 ohms
25 Watts
-30V
+C
+D
+5V6
FTD
F1
F2
VOLUME CONTROL
IR EYE
EEPROM
RDS DECODER
41-72
78
40
39
15/17
21
33/34
16/18
MAIN PROCESSOR
TMP88CU74F
73-75
28/29
CD CONTROL
TAPE CONTROL
TUNER CONTROL
AF6 CONTROL
POWER CONTROL
SHIFT REGISTER
KEY_B3
KEY_B1
KEY_B2
LPS
L
N
RELAY
+A
VOLTAGE SELECT
120V/240V
+A/2
NTC
F1
F2
-VKK

SET WIRING DIAGRAM


DIGITAL
DM XXXX
LIGHTWASHLIT
DM 60
CDC KEY
DM 1500
VOL
BD 1700
POWER
FCT 1400
KEYB.1
FCT 1300
COMBI BOARD MICRO 2001
SUPPLY (MAINS)
EHT 1201
FFT 1202
EHT 1220
FCT 1221
DM 1255
FCT xxxx
FCT 1263
FCT 1264
FCT 1265
DM 23
FCT 1222
FCT 1224
REGULATOR/STABILISER
EHT 1402
EHT 1222
FCT 1403
FCT 1400
FAN
CDR01
FRONT DISPLAY BOARD
EHT 1901
FCT 1101
FCT 1100
EHT 1900
eht 1102
FCT 1107
FCT 1106
FCT 1105
DM XXXX
ETF 6 SINGLE DECK
FCT 1706
EHT 1703
FCT 1701
FFT 1251
EHT 1252
FCT 1250
FCT 1256
FCT 1253
FCT 1262
EHS 1260
FCT 1266
3 DTC
EHS 1805
FCS 1803
FFT 1120
EHS 1801
VCD OUT
ECO 6
FCT 1120
HP
FCS 1800
MIC
FCT XXXX
1501 2P/100mm
1601 2P/140mm
1701 4P/180mm
1143 7P/120mm/AD
1142 11P/180mm/AD
1133 9P/100mm/AD
1138 19P/100mm/AD
1147 7P/220mm
1136 7P/5P/180mm/AD
1144 9P/11P/120mm
1104
1131 19P/180mm/AD
1141 7P/180mm/AD
1139 2P/180mm/220mm
1134 8P/280mm/AD/Fold
1137 4P/120mm/AD
1135 7P/220mm/AD/Fold
1146 6P/140/180mm
xxxx

LEGEND

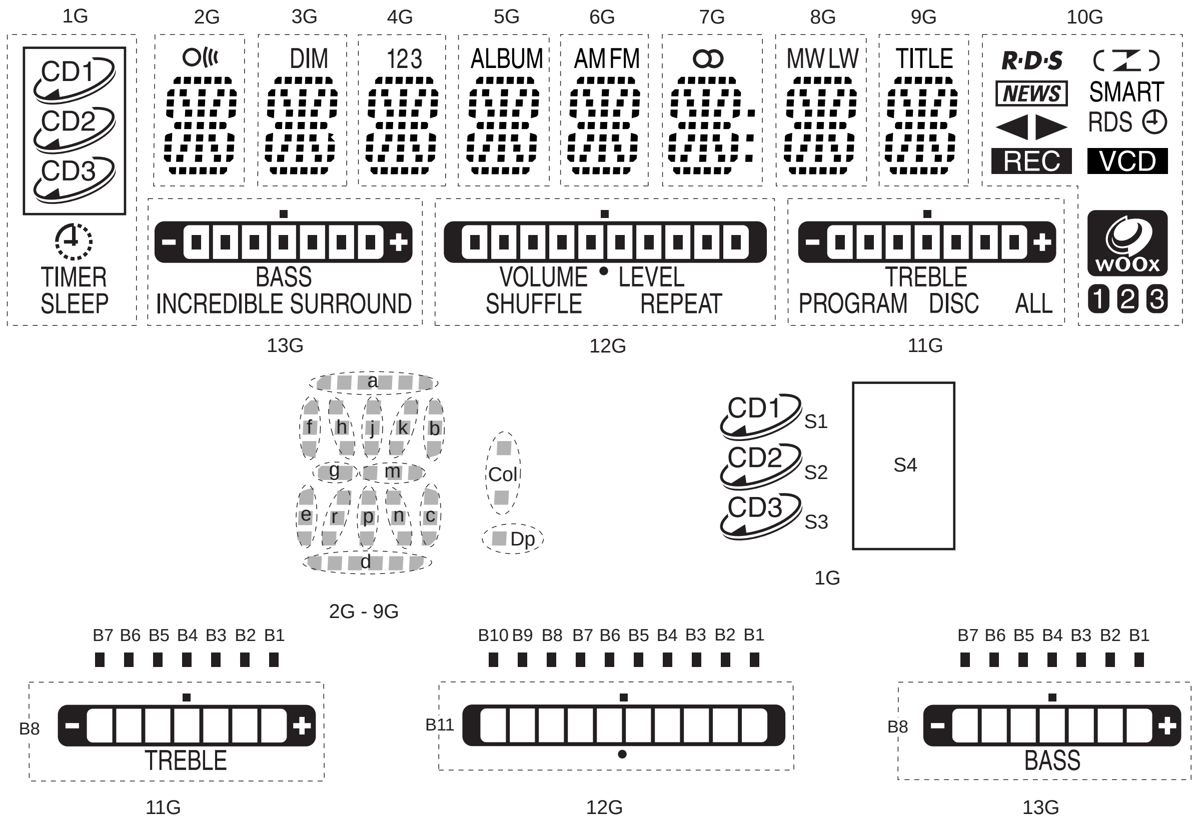
- EHS - EH SIDE ENTRY
- EHT - EH TOP ENTRY
- FCS - FFC SIDE ENTRY
- FCT - FFC TOP ENTRY
- DM - DIPMATE

FRONT DISPLAY BOARD

TABLE OF CONTENTS

FTD Display pins connection 6-1
Circuit diagram 6-2
Components & Chips Layout 6-3
Electrical parts list 6-4

FTD DISPLAY PIN ASSIGNMENT & CONNECTION



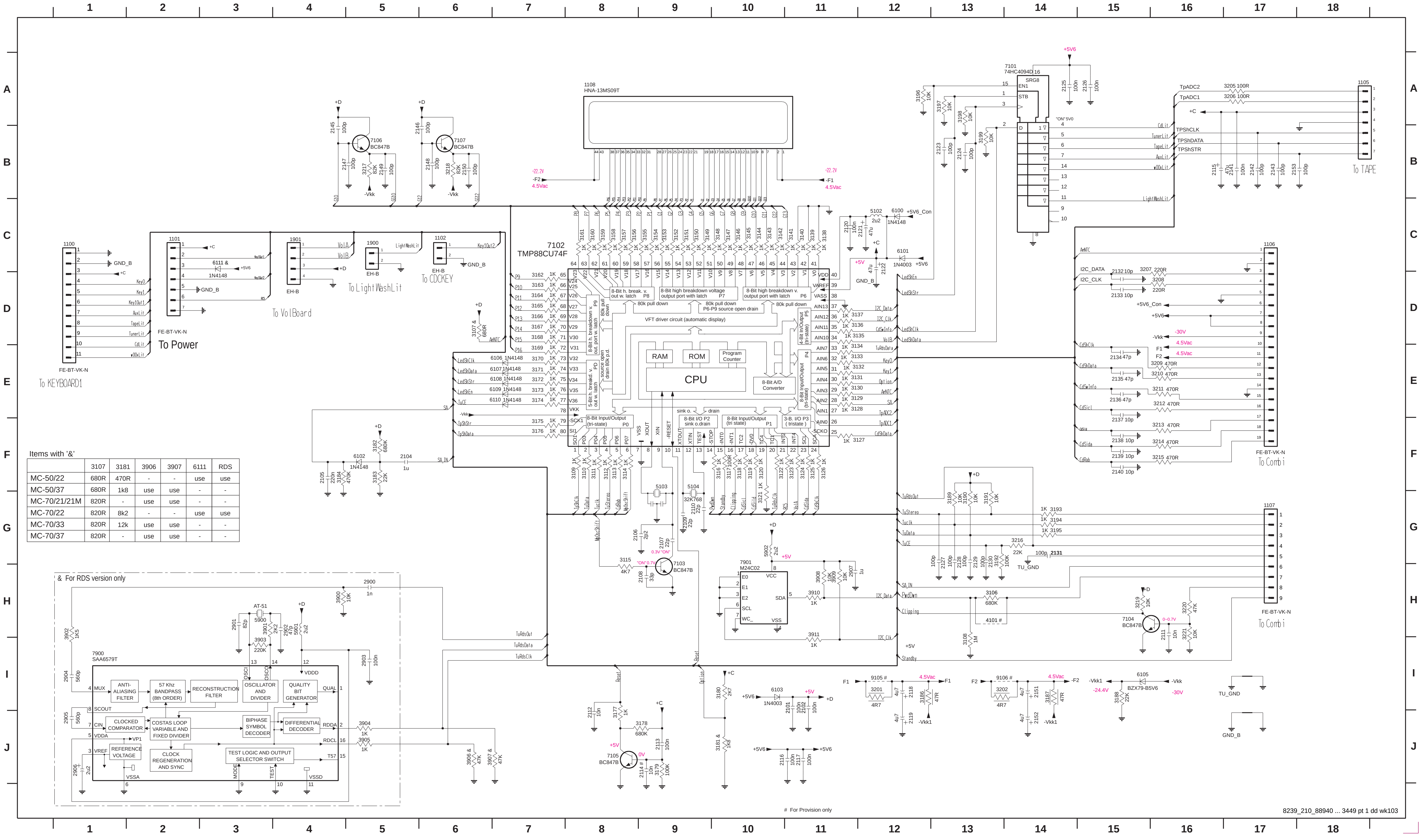
1G
2G
3G
4G
5G
6G
7G
8G
9G
10G
CD1
CD2
CD3
TIMER
SLEEP
DIM
123
ALBUM
AM FM
MW LW
TITLE
R·D·S
NEWS
SMART
RDS
REC
VCD
BASS
INCREDIBLE SURROUND
VOLUME
LEVEL
SHUFFLE
REPEAT
TREBLE
PROGRAM
DISC
ALL
wOOx
1 2 3
13G
12G
11G
a
f
h
j
k
b
g
m
e
r
p
n
c
d
Col
Dp
2G - 9G
S1
S2
S3
S4
1G
B7 B6 B5 B4 B3 B2 B1
B8
TREBLE
11G
B10 B9 B8 B7 B6 B5 B4 B3 B2 B1
B11
12G
B7 B6 B5 B4 B3 B2 B1
B8
BASS
13G

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	13G
P1	-	a	a	a	a	a	a	a	a	R·D·S	ALL	B1	-
P2	-	h	h	h	h	h	h	h	h	NEWS	DISC	B2	-
P3	SLEEP	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p	(	PROGRAM	B3	-
P4	CD1	k	k	k	k	k	k	k	k	Z	B1	B4	B1
P5	CD2	b	b	b	b	b	b	b	b	)	B2	B5	B2
P6	CD3	f	f	f	f	f	f	f	f	SMART	B3	B6	B3
P7	-	m	m	m	m	m	m	m	m	RDS ⊕	B4	B7	B4
P8	TIMER	g	g	g	g	g	g	g	g	◀	B5	B8	B5
P9	S1	c	c	c	c	c	c	c	c	▶	B6	B9	B6
P10	S2	e	e	e	e	e	e	e	e	REC	B7	B10	B7
P11	S3	r	r	r	r	r	r	r	r	VCD	-	-	INCREDIBLE SURROUND
P12	S4	n	n	n	n	n	n	n	n	wOOx	B8	B11	B8
P13	-	d	d	d	d	d	d	d	d	❶	-	VOLUME	-
P14	-	O(((	DIM	1	ALBUM	AM	ꝏ	MW	TITLE	❷	-	LEVEL	-
P15	-	-	-	2	-	FM	Col	LW	-	❸	-	SHUFFLE	-
P16	-	-	-	3	-	-	Dp	-	-	-	-	REPEAT	-

PIN NO.	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CONNECTION	F2	F2	-	-	-	-	P16	P15	P14	P13	P12	P11	P10	P9	-	-	P8	P7	P6	P5	P4	P3	P2	P1	-	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	13G	-	-	-	-	F1	F1

CIRCUIT DIAGRAM

1100	C1
1101	C2
1102	C6
1105	A18
1106	C17
1107	G17
1108	A8
1900	C5
1901	C4
2101	I11
2102	I11
2104	F5
2105	F4
2106	G8
2107	G9
2108	H9
2109	G9
2110	G9
2111	H16
2112	J8
2113	J9
2114	J9
2115	B16
2116	J10
2117	J11
2118	I12
2119	J12
2120	C11
2121	C12
2122	C12
2123	B13
2124	B13
2125	A14
2126	A15
2127	G13
2128	G13
2129	G13
2130	G13
2131	G14
2132	D15
2133	D15
2134	E15
2135	E15
2136	E15
2137	F15
2138	F15
2139	F15
2140	F15
2141	B17
2142	B17
2143	B17
2145	B4
2146	B6
2147	B5
2148	B6
2149	B5
2150	B6
2151	I14
2152	J14
2153	B17
2900	H5
2901	H3
2902	H4
2903	I5
2904	I1
2905	J1
2906	J1
2907	H11
3106	H13
3107	D6
3108	I13
3109	F8
3110	F8
3111	F8
3112	F8
3113	F8
3114	F8
3115	G8
3116	F10
3117	F10
3118	F10
3119	F10
3120	F10
3121	G10
3122	F10
3123	F11
3124	F11
3125	F11
3126	F11
3127	F12
3128	E11
3129	E11
3130	E11
3131	E11
3132	E12
3133	E11
3134	E11
3135	D12
3136	D11
3137	D11
3138	C11
3139	C11
3140	C11
3141	C11
3142	C10
3143	C10
3144	C10
3145	C10
3146	C10
3147	C10
3148	C10
3149	C9
3150	C9
3151	C9
3152	C9
3153	C9
3154	C9
3155	C9
3156	C8
3157	C8
3158	C8
3159	C8
3160	C8
3161	C8
3162	D7
3163	D7
3164	D7
3165	D7
3166	D7
3167	D7
3168	D7
3169	E7
3170	E7
3171	E7
3172	E7
3173	E7
3174	E7
3175	F7
3176	F7
3177	J8
3178	J9
3179	J9
3180	I10
3181	J10
3182	F5
3183	F5
3184	F4
3186	I12
3187	I14
3188	I15
3189	G13
3190	G13
3191	G13
3192	G13
3193	G14
3194	G14
3195	G14
3196	A12
3197	A13
3198	A13
3199	B13
3201	I12
3202	I13
3205	A17
3206	A17
3207	C15
3208	D16
3209	E16
3210	E16
3211	E16
3212	E16
3213	F16
3214	F16
3215	F16
3216	G14
3217	B5
3218	B6
3219	H15
3220	H16
3221	H16
3900	H4
3901	H3
3902	H1
3903	I3
3904	J5
3905	J5
3906	J6
3907	J6
3908	H11
3909	H11
3910	H11
3911	H11
4101	H13
5102	C12
5103	F9
5104	F9
5900	H3
5901	H4
5902	G10
6100	C12
6101	C12
6102	F5
6103	I10
6105	I15
6106	E7
6107	E7
6108	E7
6109	E7
6110	E7
6111	C3
7101	A14
7102	C7
7103	H9
7104	H15
7105	J8
7106	B5
7107	B6
7900	I1
7901	G10
9105	I12
9106	I13



1108 HNA-13MS09T
7102 TMP88CU74F
CPU
RAM
ROM
Program Counter
8-Bit A/D Converter
VFT driver circuit (automatic display)
7101 74HC4094D
7900 SAA6579T
7901 M24C02
7103 BC847B
7104 BC847B
7105 BC847B
7106 BC847B
7107 BC847B
FE-BT-VK-N
To KEYBOARD1
To Power
To VolBoard
To LightWashLit
To CDCKEY
To TAPE
To Combi
& For RDS version only
ANTI-ALIASING FILTER
57 Khz BANDPASS (8th ORDER)
RECONSTRUCTION FILTER
OSCILLATOR AND DIVIDER
QUALITY BIT GENERATOR
CLOCKED COMPARATOR
COSTAS LOOP VARIABLE AND FIXED DIVIDER
BIPHASE SYMBOL DECODER
DIFFERENTIAL DECODER
REFERENCE VOLTAGE
CLOCK REGENERATION AND SYNC
TEST LOGIC AND OUTPUT SELECTOR SWITCH

Items with ’&’

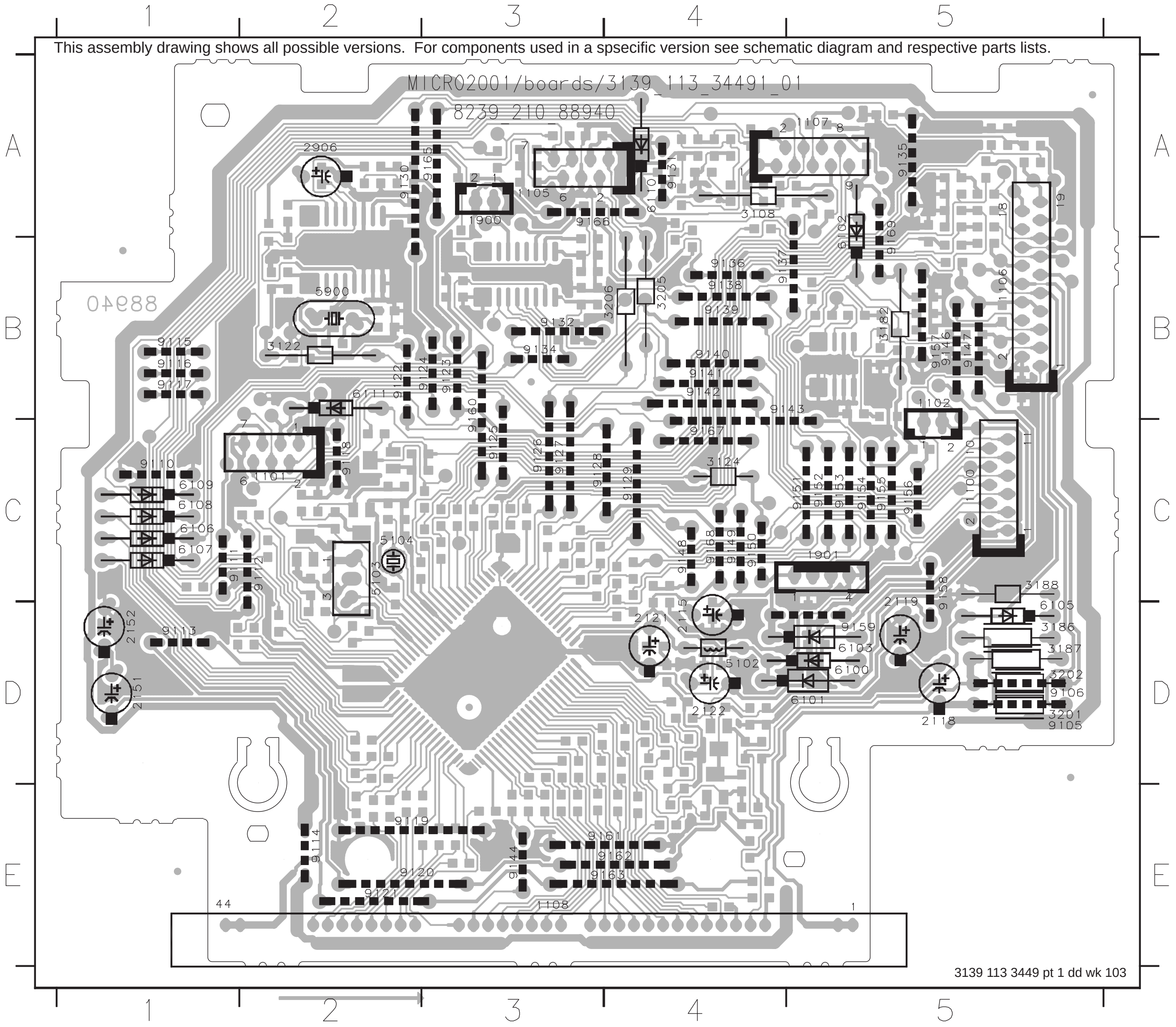
	3107	3181	3906	3907	6111	RDS
MC-50/22	680R	470R	-	-	use	use
MC-50/37	680R	1k8	use	use	-	-
MC-70/21/21M	820R	-	use	use	-	-
MC-70/22	820R	8k2	-	-	use	use
MC-70/33	820R	12k	use	use	-	-
MC-70/37	820R	-	use	use	-	-

# For Provision only

8239_210_88940 ... 3449 pt 1 dd wk103

COMPONENT LAYOUT

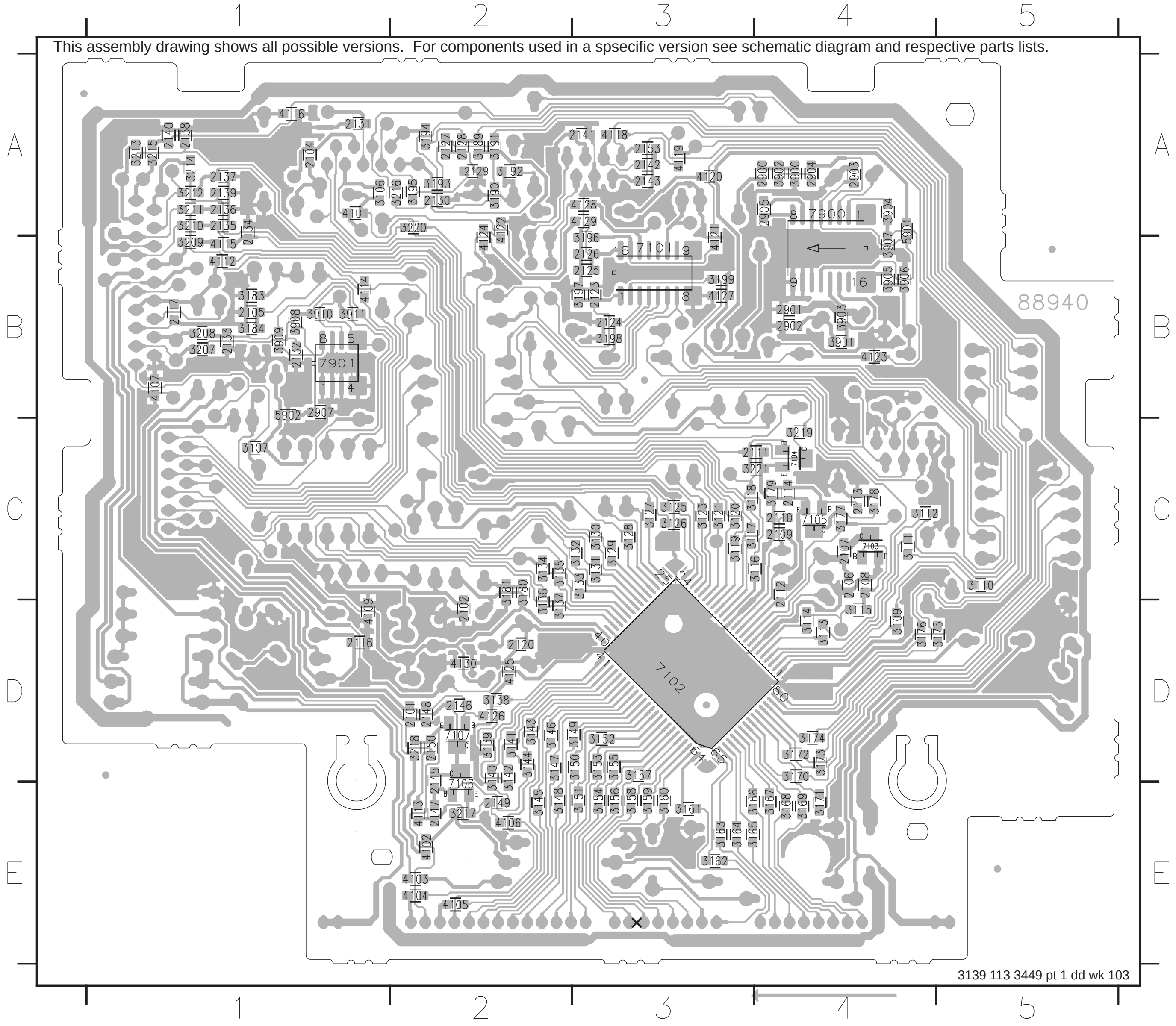
1100	C5	1901	C5	2906	A2	3201	D5	6100	D5	6109	C1	9113	D1	9121	E2	9129	C4	9138	B4	9147	B5	9155	C5	9163	E4
1101	C2	2115	D4	3108	A4	3202	D5	6101	D5	6110	A4	9114	E2	9122	B2	9130	A2	9139	B4	9148	C4	9156	C5	9165	A3
1102	B5	2118	D5	3122	B2	3205	B4	6102	A5	6111	B2	9115	B1	9123	B3	9131	A4	9140	B4	9149	C4	9157	B5	9166	A3
1105	A3	2119	C5	3124	C4	3206	B4	6103	D5	9105	D5	9116	B1	9124	B3	9132	B3	9141	B4	9150	C4	9158	C5	9167	C4
1106	B5	2121	D4	3182	B5	5102	D4	6105	D5	9106	D5	9117	B1	9125	C3	9134	B3	9142	B4	9151	C5	9159	D5	9168	C4
1107	A5	2122	D4	3186	D5	5103	C2	6106	C1	9110	C1	9118	C2	9126	C3	9135	A5	9143	B5	9152	C5	9160	B3	9169	B5
1108	E3	2151	D1	3187	D5	5104	C2	6107	C1	9111	C1	9119	E2	9127	C3	9136	B4	9144	E3	9153	C5	9161	E4		
1900	A3	2152	D1	3188	C5	5900	B2	6108	C1	9112	C2	9120	E2	9128	C3	9137	B4	9146	B5	9154	C5	9162	E4		


This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.

MICRO2001/boards/3139_113_34491_01
8239_210_88940
88940
1 2 3 4 5
A B C D E
3139 113 3449 pt 1 dd wk 103

CHIP LAYOUT

2101	D2	2120	D2	2137	A1	2901	B4	3116	C4	3133	C3	3148	E2	3163	E3	3178	C4	3198	B3	3220	A2	4102	E2	4121	B3	7104	C4
2102	D2	2123	B3	2138	A1	2902	B4	3117	C3	3134	C2	3149	D3	3164	E3	3179	C4	3199	B3	3221	C4	4103	E2	4122	A2	7105	C4
2104	A1	2124	B3	2139	A1	2903	A4	3118	C3	3135	C2	3150	D3	3165	E3	3180	C2	3207	B1	3900	A4	4104	E2	4123	B4	7106	E2
2105	B1	2125	B3	2140	A1	2904	A4	3119	C3	3136	D2	3151	E3	3166	E3	3181	C2	3208	B1	3901	B4	4105	E2	4124	B2	7107	D2
2106	C4	2126	B3	2141	A3	2905	A4	3120	C3	3137	D2	3152	D3	3167	E4	3183	B1	3209	B1	3902	A4	4106	E2	4125	D2	7900	A4
2107	C4	2127	A2	2142	A3	2907	B1	3121	C3	3138	D2	3153	D3	3168	E4	3184	B1	3210	A1	3903	B4	4107	B1	4126	D2	7901	B1
2108	C4	2128	A2	2143	A3	3106	A1	3123	C3	3139	D2	3154	E3	3169	E4	3189	A2	3211	A1	3904	A4	4109	D1	4127	B3		
2109	C4	2129	A2	2145	D2	3107	C1	3125	C3	3140	D2	3155	D3	3170	D4	3190	A2	3212	A1	3905	B4	4112	B1	4128	A3		
2110	C4	2130	A2	2146	D2	3109	D4	3126	C3	3141	D2	3156	E3	3171	E4	3191	A2	3213	A1	3906	B4	4113	E2	4129	A3		
2111	C4	2131	A1	2147	E2	3110	C5	3127	C3	3142	D2	3157	D3	3172	D4	3192	A2	3214	A1	3907	B4	4114	B1	4130	D2		
2112	C4	2132	B1	2148	D2	3111	C4	3128	C3	3143	D2	3158	E3	3173	D4	3193	A2	3215	A1	3908	B1	4115	B1	5901	A4		
2113	C4	2133	B1	2149	E2	3112	C4	3129	C3	3144	D2	3159	E3	3174	D4	3194	A2	3216	A2	3909	B1	4116	A1	5902	B1		
2114	C4	2134	A1	2150	D2	3113	D4	3130	C3	3145	E2	3160	E3	3175	D5	3195	A2	3217	E2	3910	B1	4118	A3	7101	B3		
2116	D1	2135	A1	2153	A3	3114	D4	3131	C3	3146	D2	3161	E3	3176	D4	3196	B3	3218	D2	3911	B1	4119	A3	7102	D3		
2117	B1	2136	A1	2900	A4	3115	D4	3132	C3	3147	D2	3162	E3	3177	C4	3197	B3	3219	C4	4101	A1	4120	A3	7103	C4		


This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.

ELECTRICAL PARTS LIST - FRONT DISPLAY BOARD

MISCELLANEOUS

1100	4822 267 11039	Flex Socket 11pin Vert.
1101	4822 267 10953	Flex Socket 7pin Vert.
1105	4822 267 10953	Flex Socket 7pin Vert.
1106	4822 265 11553	Flex Socket 19pin Vert.
1107	2422 025 14518	Flex Socket 9pin Vert.
1108	3139 110 52680	FTD Display HNA-13MS09T

CAPACITORS

2101	4822 126 14305	100nF 10% 16V
2102	4822 126 14305	100nF 10% 16V
2104	3198 017 41050	1µF +80/-20% 10V
2105	4822 126 13879	220nF +80/-20% 16V
2106	4822 126 14223	2,2pF +/-0,25pF 50V
2107	4822 122 33761	22pF 5% 50V
2108	4822 126 11671	33pF 5% 50V
2109	4822 122 33761	22pF 5% 50V
2110	4822 122 33761	22pF 5% 50V
2111	5322 126 11583	10nF 10% 50V
2112	5322 126 11583	10nF 10% 50V
2113	4822 126 14305	100nF 10% 16V
2115	4822 124 40433	47µF 20% 25V
2116	4822 126 14305	100nF 10% 16V
2117	4822 126 14305	100nF 10% 16V
2118	4822 124 40769	4,7µF 20% 100V
2119	4822 124 40769	4,7µF 20% 100V
2120	4822 126 14305	100nF 10% 16V
2121	4822 124 40433	47µF 20% 25V
2122	4822 124 40433	47µF 20% 25V
2123	4822 122 31765	100pF 2% 63V
2124	4822 122 31765	100pF 2% 63V
2125	4822 126 14305	100nF 10% 16V
2126	4822 126 14305	100nF 10% 16V
2127	4822 122 31765	100pF 2% 63V
2128	4822 122 31765	100pF 2% 63V
2129	4822 122 31765	100pF 2% 63V
2130	4822 122 31765	100pF 2% 63V
2131	4822 122 31765	100pF 2% 63V
2132	4822 122 33741	10pF 10% 50V
2133	4822 122 33741	10pF 10% 50V
2134	4822 122 33777	47pF 5% 63V
2135	4822 122 33777	47pF 5% 63V
2136	4822 122 33777	47pF 5% 63V
2137	4822 122 33741	10pF 10% 50V
2138	4822 122 33741	10pF 10% 50V
2139	4822 122 33741	10pF 10% 50V
2140	4822 122 33741	10pF 10% 50V
2141	4822 126 14305	100nF 10% 16V
2142	4822 122 31765	100pF 2% 63V
2143	4822 122 31765	100pF 2% 63V
2145	4822 122 31765	100pF 2% 63V
2146	4822 122 31765	100pF 2% 63V
2147	4822 122 31765	100pF 2% 63V
2148	4822 122 31765	100pF 2% 63V
2149	4822 122 31765	100pF 2% 63V
2150	4822 122 31765	100pF 2% 63V
2151	4822 124 40769	4,7µF 20% 100V
2152	4822 124 40769	4,7µF 20% 100V
2153	4822 122 31765	100pF 2% 63V
2900	3198 016 31020	1nF 5% 25V
2901	4822 126 14226	82pF 1% 50V
2902	4822 122 33777	47pF 5% 63V
2903	4822 126 14305	100nF 10% 16V
2904	4822 126 14249	560pF 5% 25V
2905	4822 126 14249	560pF 5% 25V
2906	4822 124 22652	2,2µF 20% 50V
2907	3198 017 41050	1µF +80/-20% 10V

RESISTORS

3106	4822 051 30684	680k 5% 0,062W
3107	4822 117 12968	820R 5% 0,62W
3108	4822 116 83866	1M 5% 0,5W
3109	4822 051 30102	1k 5% 0,062W
3110	4822 051 30102	1k 5% 0,062W
3111	4822 051 30102	1k 5% 0,062W
3112	4822 051 30102	1k 5% 0,062W
3113	4822 051 30102	1k 5% 0,062W
3114	4822 051 30102	1k 5% 0,062W
3115	4822 051 30472	4k7 5% 0,062W
3116	4822 051 30102	1k 5% 0,062W
3117	4822 051 30101	100R 5% 0,062W
3118	4822 051 30102	1k 5% 0,062W
3119	4822 051 30102	1k 5% 0,062W
3120	4822 051 30102	1k 5% 0,062W
3121	4822 051 30102	1k 5% 0,062W
3122	4822 050 11002	1k 1% 0,4W
3123	4822 051 30102	1k 5% 0,062W
3124	4822 050 11002	1k 1% 0,4W
3125	4822 051 30102	1k 5% 0,062W
3126	4822 051 30102	1k 5% 0,062W
3127	4822 051 30102	1k 5% 0,062W
3128	4822 051 30102	1k 5% 0,062W
3129	4822 051 30102	1k 5% 0,062W
3130	4822 051 30102	1k 5% 0,062W
3131	4822 051 30102	1k 5% 0,062W
3132	4822 051 30102	1k 5% 0,062W
3133	4822 051 30102	1k 5% 0,062W
3134	4822 051 30102	1k 5% 0,062W
3135	4822 051 30102	1k 5% 0,062W
3136	4822 051 30102	1k 5% 0,062W
3137	4822 051 30102	1k 5% 0,062W
3138	4822 051 30102	1k 5% 0,062W
3139	4822 051 30102	1k 5% 0,062W
3140	4822 051 30102	1k 5% 0,062W
3141	4822 051 30102	1k 5% 0,062W

3142	4822 051 30102	1k 5% 0,062W
3143	4822 051 30102	1k 5% 0,062W
3144	4822 051 30102	1k 5% 0,062W
3145	4822 051 30102	1k 5% 0,062W
3146	4822 051 30102	1k 5% 0,062W
3147	4822 051 30102	1k 5% 0,062W
3148	4822 051 30102	1k 5% 0,062W
3149	4822 051 30102	1k 5% 0,062W
3150	4822 051 30102	1k 5% 0,062W
3151	4822 051 30102	1k 5% 0,062W
3152	4822 051 30102	1k 5% 0,062W
3153	4822 051 30102	1k 5% 0,062W
3154	4822 051 30102	1k 5% 0,062W
3155	4822 051 30102	1k 5% 0,062W
3156	4822 051 30102	1k 5% 0,062W
3157	4822 051 30102	1k 5% 0,062W
3158	4822 051 30102	1k 5% 0,062W
3159	4822 051 30102	1k 5% 0,062W
3160	4822 051 30102	1k 5% 0,062W
3161	4822 051 30102	1k 5% 0,062W
3162	4822 051 30102	1k 5% 0,062W
3163	4822 051 30102	1k 5% 0,062W
3164	4822 051 30102	1k 5% 0,062W
3165	4822 051 30102	1k 5% 0,062W
3166	4822 051 30102	1k 5% 0,062W
3167	4822 051 30102	1k 5% 0,062W
3168	4822 051 30102	1k 5% 0,062W
3169	4822 051 30102	1k 5% 0,062W
3170	4822 051 30102	1k 5% 0,062W
3171	4822 051 30102	1k 5% 0,062W
3172	4822 051 30102	1k 5% 0,062W
3173	4822 051 30102	1k 5% 0,062W
3174	4822 051 30102	1k 5% 0,062W
3175	4822 051 30102	1k 5% 0,062W
3176	4822 051 30102	1k 5% 0,062W
3177	4822 051 30102	1k 5% 0,062W
3178	4822 051 30684	680k 5% 0,062W
3179	4822 117 13632	100k 1% 0,062W
3180	4822 051 30272	2k7 5% 0,062W
3181	4822 117 12902	8k2 5% 0,062W
3182	4822 116 52298	680k 5% 0,5W
3183	4822 051 30223	22k 5% 0,062W
3184	4822 051 30474	470k 5% 0,062W
3186	4822 052 10479	47R 5% 0,33W
3187	4822 052 10479	47R 5% 0,33W
3188	4822 116 52257	22k 5% 0,5W
3189	4822 051 30103	10k 5% 0,062W
3190	4822 051 30103	10k 5% 0,062W
3191	4822 051 30103	10k 5% 0,062W
3192	4822 117 13632	100k 1% 0,062W
3193	4822 051 30102	1k 5% 0,062W
3194	4822 051 30102	1k 5% 0,062W
3195	4822 051 30102	1k 5% 0,062W
3196	4822 051 30103	10k 5% 0,062W
3197	4822 051 30103	10k 5% 0,062W
3198	4822 051 30103	10k 5% 0,062W
3199	4822 051 30103	10k 5% 0,062W
3201	4822 052 10478	4R7 5% 0,33W
3202	4822 052 10478	4R7 5% 0,33W
3205	4822 116 52175	100R 5% 0,5W
3206	4822 116 52175	100R 5% 0,5W
3207	4822 051 30221	220R 5% 0,062W
3208	4822 051 30221	220R 5% 0,062W
3209	4822 051 30471	470R 5% 0,062W
3210	4822 051 30471	470R 5% 0,062W
3211	4822 051 30471	470R 5% 0,062W
3212	4822 051 30471	470R 5% 0,062W
3213	4822 051 30471	470R 5% 0,062W
3214	4822 051 30471	470R 5% 0,062W
3215	4822 051 30471	470R 5% 0,062W
3216	4822 051 30223	22k 5% 0,062W
3217	4822 117 12864	82k 5% 0,6W
3218	4822 117 12864	82k 5% 0,6W
3219	4822 051 30103	10k 5% 0,062W
3220	4822 117 12925	47k 1% 0.063W
3221	4822 051 30103	10k 5% 0,062W
3900	4822 051 30103	10k 5% 0,062W
3901	4822 051 30222	2k2 5% 0,062W
3902	4822 051 30152	1k5 5% 0,062W
3903	4822 117 12891	220k 5% 0,062W
3904	4822 051 30102	1k 5% 0,062W
3905	4822 051 30102	1k 5% 0,062W
3906	4822 117 12925	47k 1% 0.063W
3907	4822 117 12925	47k 1% 0.063W
3908	4822 051 30103	10k 5% 0,062W
3909	4822 051 30103	10k 5% 0,062W
3910	4822 051 30102	1k 5% 0,062W
3911	4822 051 30102	1k 5% 0,062W
4102	4822 051 30008	0R Jumper 0603
4103	4822 051 30008	0R Jumper 0603
4104	4822 051 30008	0R Jumper 0603
4105	4822 051 30008	0R Jumper 0603
4106	4822 051 30008	0R Jumper 0603
4107	4822 051 30008	0R Jumper 0603
4109	4822 051 30008	0R Jumper 0603
4112	4822 051 30008	0R Jumper 0603
4113	4822 051 30008	0R Jumper 0603
4114	4822 051 30008	0R Jumper 0603
4115	4822 051 30008	0R Jumper 0603
4116	4822 051 30008	0R Jumper 0603
4118	4822 051 30008	0R Jumper 0603
4119	4822 051 30008	0R Jumper 0603
4120	4822 051 30008	0R Jumper 0603
4121	4822 051 30008	0R Jumper 0603

ELECTRICAL PARTS LIST - FRONT DISPLAY BOARD

RESISTORS

4122	4822 051 30008	0R Jumper 0603
4123	4822 051 30008	0R Jumper 0603
4124	4822 051 30008	0R Jumper 0603
4125	4822 051 30008	0R Jumper 0603
4126	4822 051 30008	0R Jumper 0603
4127	4822 051 30008	0R Jumper 0603
4128	4822 051 30008	0R Jumper 0603
4129	4822 051 30008	0R Jumper 0603
4130	4822 051 30008	0R Jumper 0603

COILS & FILTERS

5102	4822 157 62552	Coil 2,2µH 5%
5103	5322 242 73686	Ceram Resonator 12MHz
5104	4822 242 70938	X’tal Resonator 32,768kHz
5900	4822 242 72195	Quartz 4,332MHz
5901	4822 157 10586	2,2µH 10% 0805
5902	4822 157 10586	2,2µH 10% 0805

DIODES

6100	4822 130 30621	1N4148
6101	4822 130 31878	1N4003G
6102	4822 130 30621	1N4148
6103	4822 130 31878	1N4003G
6105	4822 130 34173	BZX79-B5V6
6106	4822 130 30621	1N4148
6107	4822 130 30621	1N4148
6108	4822 130 30621	1N4148
6109	4822 130 30621	1N4148
6110	4822 130 30621	1N4148
6111	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 15449	74HC4094D
7102	3139 110 52810	TMP88CU74YF "MC50S52811"
7103	4822 130 60511	BC847B
7104	4822 130 60511	BC847B
7105	4822 130 60511	BC847B
7106	4822 130 60511	BC847B
7107	4822 130 60511	BC847B
7900	9352 679 67118	SAA6579T/V1/M4
7901	9322 145 26668	M24C02-WMN6

Note: Only the parts mentioned in this list are normal service spare parts.

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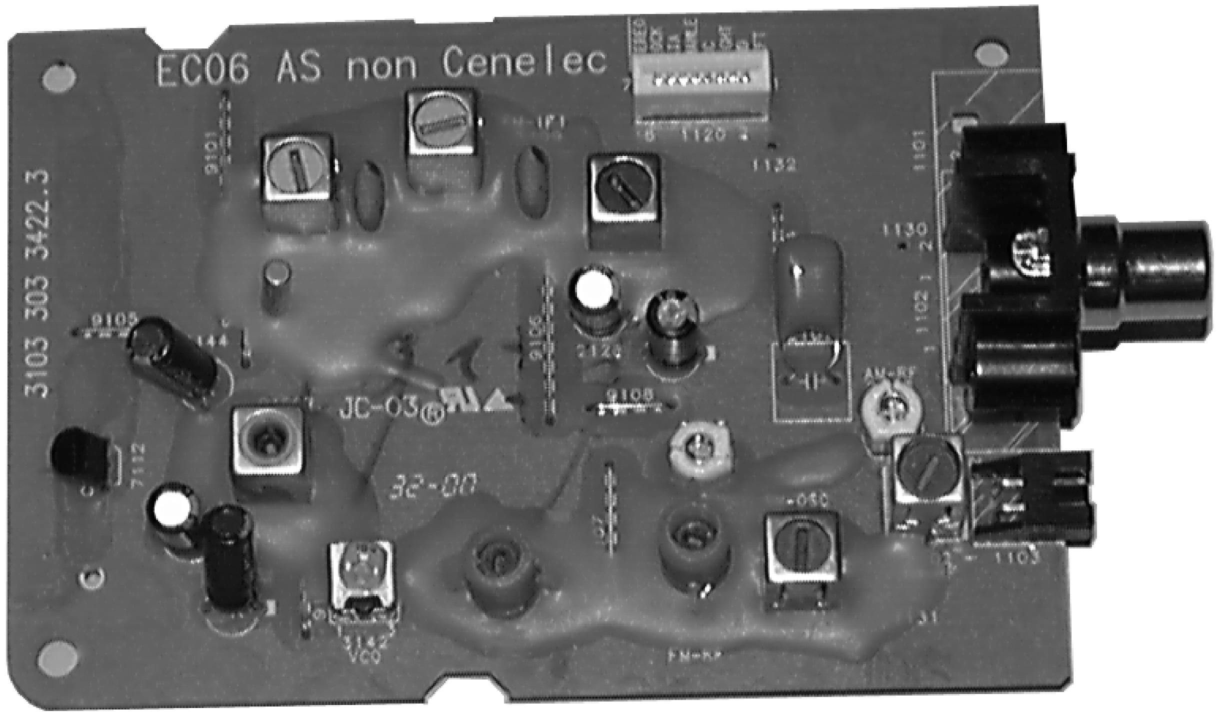
EC06 AS non Cenelec
3103 303 3422.3
9101
9105
9106
9108
1120
1132
1130
1101
1102
1103
7112
JC-03
32-00
3142
VCO
AM-RF
FM-RF
-OSC

ECO6 Tuner Board

version: ***SYSTEMS non-CENELEC***

TABLE OF CONTENTS

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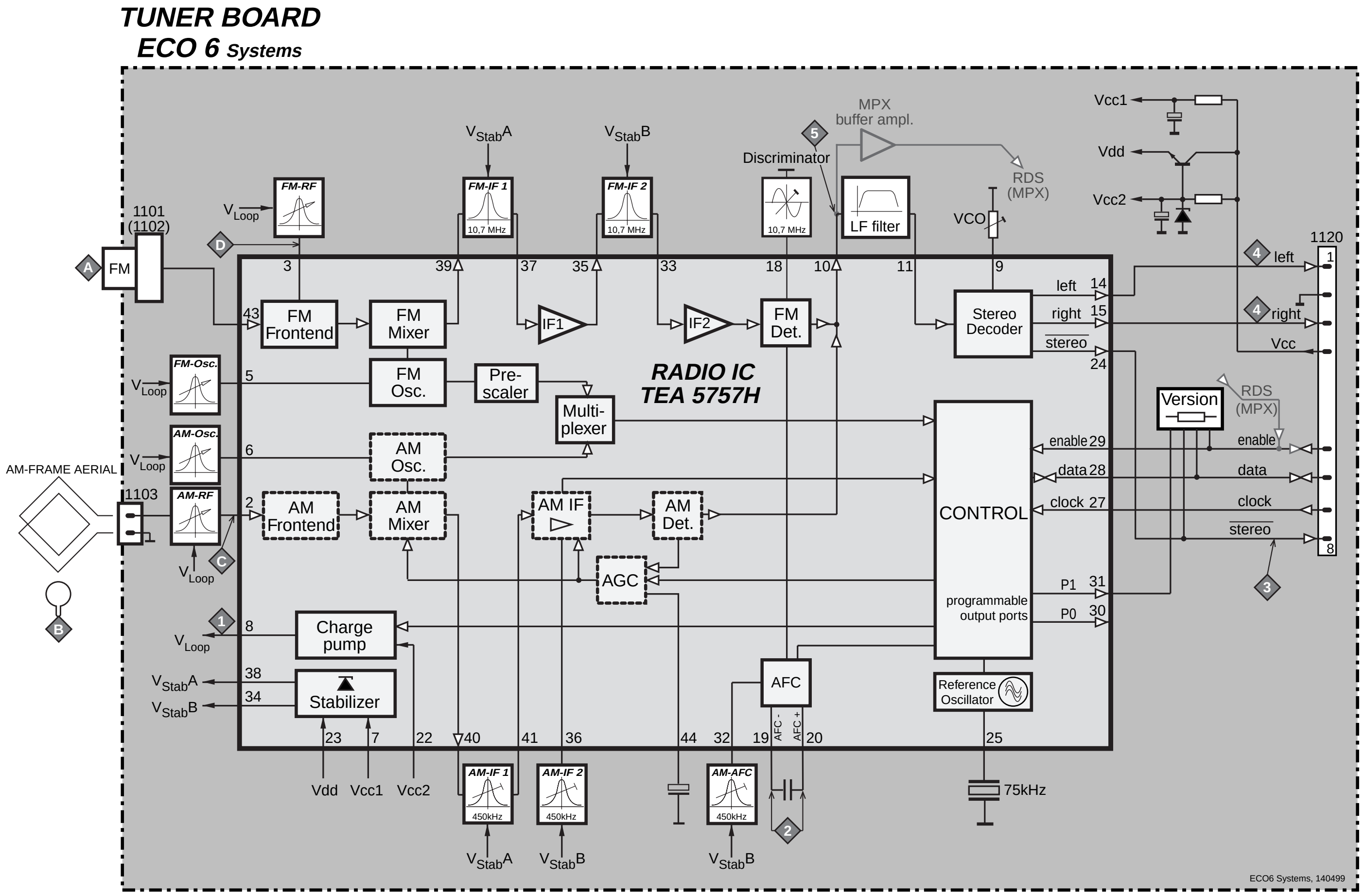
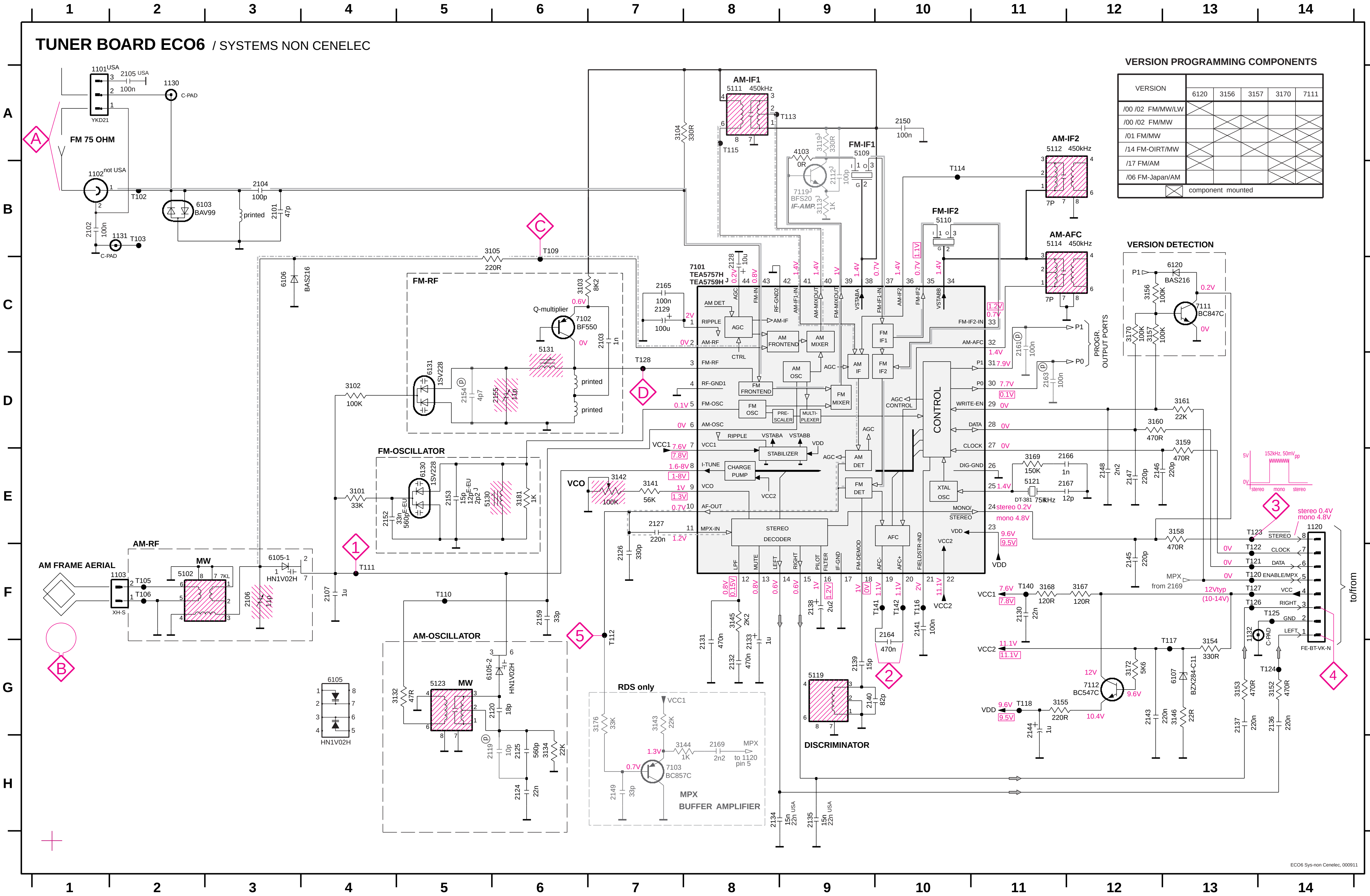
Component Layout..7A-3
Adjustment table 7A-3
Electrical Partslist..7A-4

BLOCK DIAGRAM


TUNER BOARD
ECO 6 Systems
RADIO IC
TEA 5757H
FM Frontend
FM Mixer
FM Osc.
Pre-scaler
Multi-plexer
AM Osc.
AM Frontend
AM Mixer
AM IF
AM Det.
AGC
IF1
IF2
FM Det.
Stereo Decoder
CONTROL
programmable output ports
Charge pump
Stabilizer
AFC
Reference Oscillator
Discriminator
LF filter
MPX buffer ampl.
RDS (MPX)
VCO
Version
FM-RF
FM-IF 1
FM-IF 2
10,7 MHz
FM-Osc.
AM-Osc.
AM-RF
AM-IF 1
AM-IF 2
AM-AFC
450kHz
75kHz
VStabA
VStabB
VLoop
Vcc1
Vdd
Vcc2
Vcc
left
right
stereo
enable
data
clock
P1
P0
AFC -
AFC +
FM
1101 (1102)
1103
1120
AM-FRAME AERIAL
Vdd Vcc1 Vcc2
ECO6 Systems, 140499

TUNER BOARD ECO6 / SYSTEMS NON CENELEC


FM 75 OHM
1101 USA
YKD21
2105 USA 100n
1130 C-PAD
1102 not USA
T102
2104 100p
6103 BAV99
printed
2101 47p
2102 100n
1131 T103 C-PAD
3105 220R
T109
6106 BAS216
FM-RF
Q-multiplier
7102 BF550
3103 8K2
2103 1n
5131
6131 1SV228
2154 4p7
2155 10p
printed
3102 100K
FM-OSCILLATOR
6130 1SV228
2152 33n 560p E-EU
2153 15p 12p E-EU 2p2 J
5130
3181 1K
3101 33K
VCO
3142 100K
3141 56K
AM-RF
AM FRAME AERIAL
1103 XH-S
T105 T106
MW
5102
2106 10p
6105-1 HN1V02H
2107 1u
T111
T110
2159 33p
AM-OSCILLATOR
5123 MW
6105-2 HN1V02H
3132 47R
2120 18p
2119 10p
2125 560p
3134 22K
2124 22n
6105 HN1V02H
RDS only
VCC1
3176 33K
3143 22K
3144 1K
2169 2n2
MPX to 1120 pin 5
7103 BC857C
2149 33p
MPX BUFFER AMPLIFIER
T112
T128
AM-IF1
5111 450kHz
T113 T115
3104 330R
2150 100n
FM-IF1 5109
4103 0R
3119 J 330R
7119 BFS20 IF-AMP J
2112 J 100p
3113 J 1K
T114
AM-IF2 5112 450kHz
FM-IF2 5110
AM-AFC 5114 450kHz
7101 TEA5757H TEA5759H
2128 10u
2165 100n
2129 100u
AM DET
AGC
RIPPLE
AM-RF
AM FRONTEND
AM MIXER
CTRL
AM OSC
FM-RF
RF-GND1
FM FRONTEND
FM MIXER
FM-OSC
FM OSC
PRE-SCALER
MULTI-PLEXER
AM-OSC
VSTABA VSTABB
STABILIZER
VDD
VCC1
I-TUNE
CHARGE PUMP
VCO
VCC2
AF-OUT
MPX-IN
STEREO DECODER
AM IF
FM IF1
FM IF2
AM DET
FM DET
AFC
CONTROL
XTAL OSC
AGC CONTROL
WRITE-EN
DATA
CLOCK
DIG-GND
MONO/STEREO
P1 P0
FM-IF2-IN
AM-AFC
2127 220n
2126 330p
2131 470n
3145 2K2
2132 470n
2133 1u
2138 2u2
2164 470n
2139 15p
2140 82p
5119
DISCRIMINATOR
2141 100n
T141 T142 T116
VCC2
2161 100n
2163 100n
PROGR. OUTPUT PORTS
3169 150K
2166 1n
5121 DT-381 75kHz
2167 12p
2148 2n2
2147 220p
2146 220p
3161 22K
3160 470R
3159 470R
3158 470R
2145 220p
VERSION DETECTION
6120 BAS216
7111 BC847C
3156 100K
3170 100K
3157 100K
5V 152kHz, 50mVpp 0V stereo mono stereo
stereo 0.4V mono 4.8V
1120 FE-BT-VK-N
T123 STEREO
T122 CLOCK
T121 DATA
T120 ENABLE/MPX
T127 VCC
T126 RIGHT
T125 GND
LEFT
to/from
MPX from 2169
12Vtyp (10-14V)
VCC1 T140
3168 120R
3167 120R
2130 22n
VCC2
T117
3154 330R
1132 C-PAD
T124
7112 BC547C
3172 5K6
6107 BZX284-C11
2143 220n
3146 22R
3153 470R
2137 220n
3152 470R
2136 220n
VDD T118
3155 220R
2144 1u
2134 15n 22n USA
2135 15n 22n USA
ECO6 Sys-non Cenelec, 000911

VERSION PROGRAMMING COMPONENTS

VERSION	6120	3156	3157	3170	7111
/00 /02 FM/MW/LW	☒				
/00 /02 FM/MW		☒	☒		☒
/01 FM/MW		☒		☒	☒
/14 FM-OIRT/MW	☒		☒		☒
/17 FM/AM	☒			☒	☒
/06 FM-Japan/AM				☒	☒

☒ component mounted

LEGEND

ⓟ...for provision only
USA ... for USA version only
E-EU ... for East European version only
J ... for Japanese version only

EVM

...V FM mode stereo
...V MW mode
...V LW mode
voltages measured while set is tuned to a strong transmitter

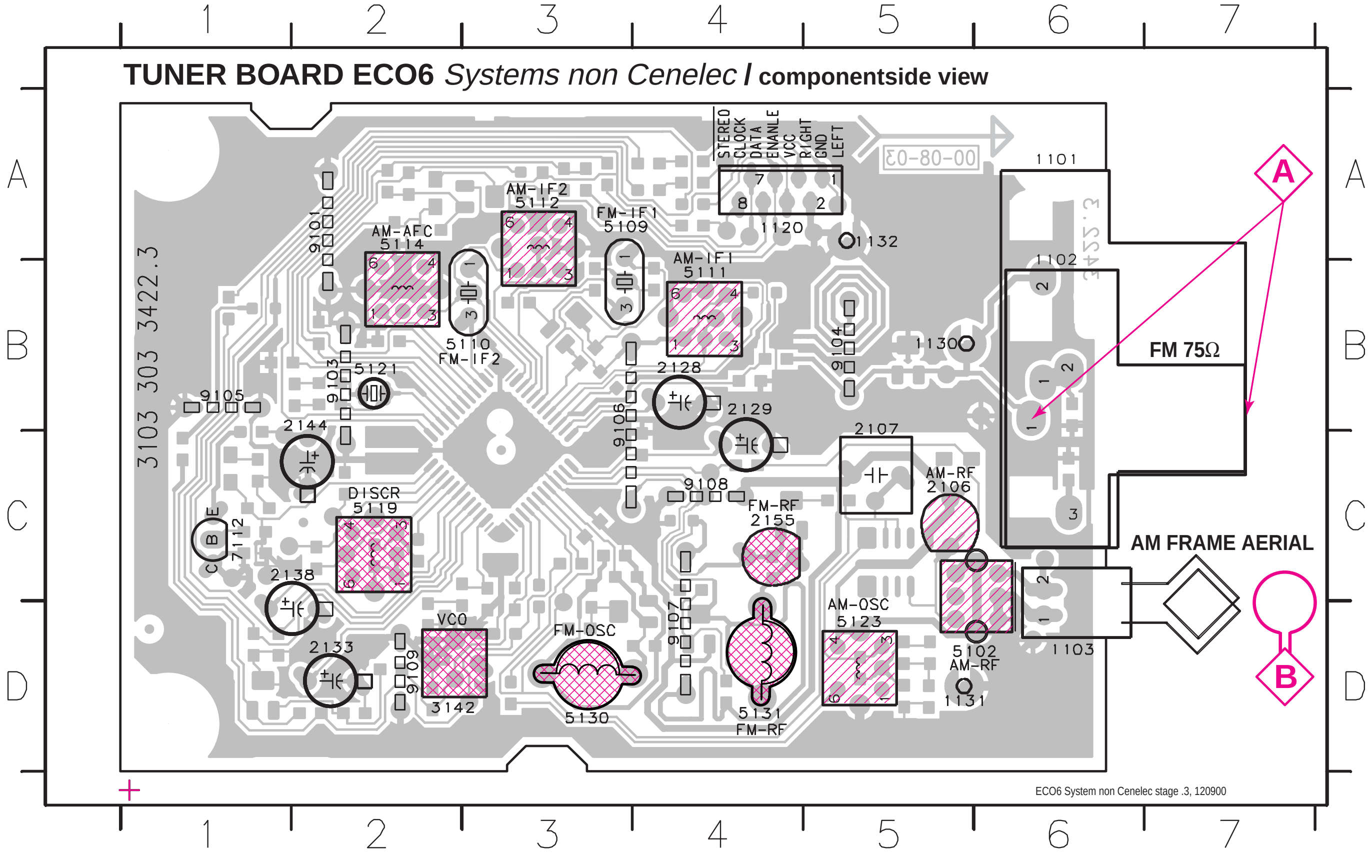
Signal path

FM
AM
MPX (Audio Frequency)
AF - left/right

1101	A1
1102	B1
1103	F2
1120	E14
1130	A2
1131	B2
1132	G13
2101	B3
2102	B1
2103	C7
2104	B3
2105	A2
2106	F3
2107	F4
2119	H6
2120	G6
2124	H6
2125	H6
2126	F7
2127	E7
2128	C8
2129	C7
2130	F11
2131	G8
2132	G8
2133	G8
2134	H8
2135	H9
2136	G14
2137	G13
2138	F9
2139	G9
2140	G9
2141	F10
2143	G12
2144	G11
2145	F12
2146	E12
2147	E12
2148	E12
2149	H7
2150	A10
2152	E4
2153	E5
2154	D5
2155	D5
2159	F6
2161	C11
2163	D11
2164	F10
2165	C7
2166	E11
2167	E11
2169	H8
3101	E4
3102	D4
3103	C6
3104	A7
3105	B6
3132	G5
3134	H6
3141	E7
3142	E7
3143	G7
3144	H7
3145	F8
3146	G13
3152	G14
3153	G13
3154	G13
3155	G11
3156	C12
3157	C12
3158	E13
3159	D13
3160	D12
3161	D13
3167	F12
3168	F11
3169	E11
3170	C12
3172	G12
3176	G7
3181	E6
5102	F2
5109	B9
5110	B10
5111	A8
5112	A11
5114	B11
5119	G9
5121	E11
5123	G5
5130	E5
5131	C6
6103	B2
6105-1	F3
6105-2	G5
6106	C3
6107	G13
6120	C13
6130	E5
6131	D5
7101	C8
7102	C6
7103	H7
7111	C13
7112	G12
T102	B2
T103	B2
T105	F2
T106	F2
T109	B6
T110	F5
T111	F4
T112	F7
T113	A8
T114	B10
T115	A8
T116	F10
T117	G13
T118	G11
T120	F13
T121	F13
T122	F13
T123	E13
T124	G14
T125	F14
T126	F13
T127	F13
T128	D7
T140	F11
T141	F10
T142	F10

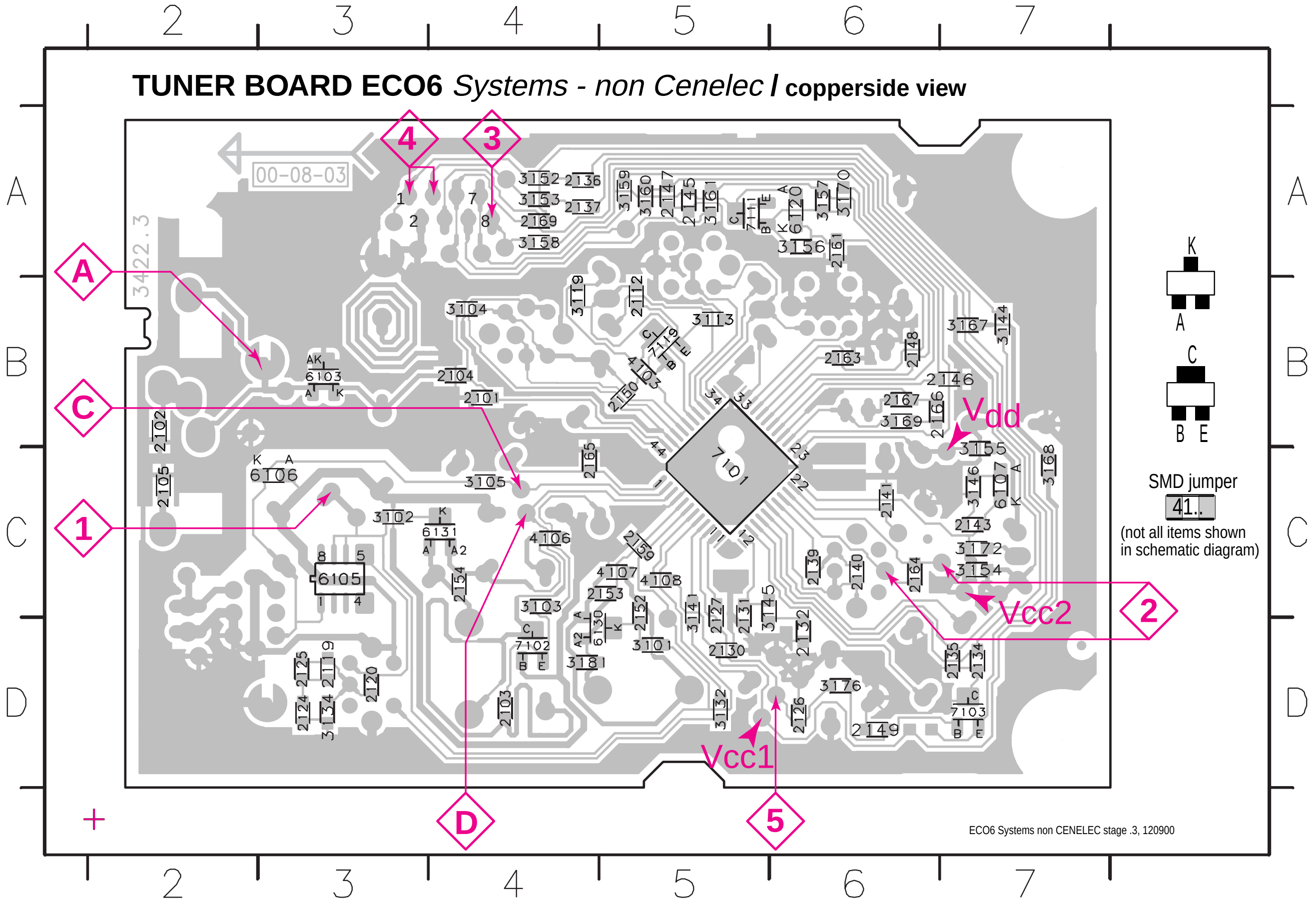
1101	A6	1120	A4	1132	A5	2128	C4	2138	C2	3142	D2	5110	B3	5114	A2	5123	D5	7112	C1	9104	B5	9107	D4
1102	B6	1130	B5	2106	C5	2129	B4	2144	B2	5102	D6	5111	B4	5119	C2	5130	D3	9101	A2	9105	B1	9108	C4
1103	D6	1131	D5	2107	B5	2133	D2	2155	C4	5109	A3	5112	A3	5121	B2	5131	D4	9103	B2	9106	B3	9109	D2

TUNER BOARD ECO6 *Systems non Cenelec* / componentside view


1
2
3
4
5
6
7
A
B
C
D
3103 303 3422.3
E0-80-00
STEREO
CLOCK
DATA
ENABLE
VCC
RIGHT
GND
LEFT
1120
1132
1101
1102
1130
AM-IF2
5112
AM-AFC
5114
FM-IF1
5109
AM-IF1
5111
5110
FM-IF2
5121
9101
9103
9104
9105
9106
9107
9108
9109
2128
2129
2107
2144
DISCR
5119
7112
2138
2133
VCO
3142
FM-OSC
5130
FM-RF
2155
5131
FM-RF
AM-OSC
5123
AM-RF
2106
5102
AM-RF
1131
1103
FM 75Ω
AM FRAME AERIAL
A
B
ECO6 System non Cenelec stage .3, 120900

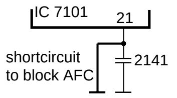
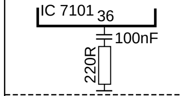
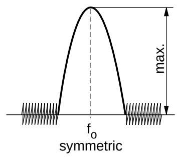
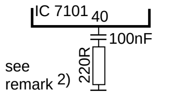
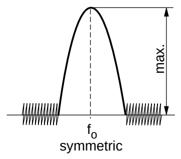
2101	B4	2119	D3	2130	D5	2137	A4	2146	B7	2153	C5	2165	C4	3103	C4	3134	D3	3152	A4	3158	A4	3169	B6	4106	C4	6107	C7	7103	D7
2102	B1	2120	D3	2131	C5	2139	C6	2147	A5	2154	C4	2166	B6	3104	B4	3141	C5	3153	A4	3159	A5	3170	A6	4107	C5	6120	A6	7111	A5
2103	D4	2124	D3	2132	D6	2140	C6	2148	B6	2159	C5	2167	B6	3105	C4	3143	D6	3154	C7	3160	A5	3172	C7	4108	C5	6130	D4	7119	B5
2104	B4	2125	D3	2134	D7	2141	C6	2149	D6	2161	A6	2169	A4	3113	B5	3144	B7	3155	C7	3161	A5	3176	D6	6103	B3	6131	C4		
2105	C1	2126	D6	2135	D7	2143	C7	2150	B5	2163	B6	3101	D5	3119	B5	3145	C5	3156	A6	3167	B7	3181	D4	6105	C3	7101	C5		
2112	B5	2127	C5	2136	A4	2145	A5	2152	C5	2164	C6	3102	C3	3132	D5	3146	C7	3157	A6	3168	C7	4103	B5	6106	C3	7102	D4		

TUNER BOARD ECO6 *Systems - non Cenelec* / copperside view


2
3
4
5
6
7
A
B
C
D
00-08-03
3422.3
4
3
A
C
1
2
D
5
Vdd
Vcc2
Vcc1
7101
6103
6106
6105
6131
7102
K
A
C
B E
SMD jumper
41..
(not all items shown in schematic diagram)
ECO6 Systems non CENELEC stage .3, 120900

These assembly drawings show a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

TUNER ADJUSTMENT TABLE (ECO6 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW			279kHz	5122		8V ±0.2V
153 - 279kHz			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 45mV continuous wave	D	 IC 7101 21 shortcircuit to block AFC 2141	5119	2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A	108MHz	2155	4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz [1]
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	C Δf=±10kHz V_{RF} = 0.5mV (as low as possible)	 IC 7101 36 100nF 220R	5111	5	 max. f_o symmetric
			see remark [2]  IC 7101 40 100nF 220R	5112		
AM AFC **MW**		C continuous wave V_{RF} = 2mV		5114	2	0 ± 2 mV DC
AM RF [3]						
MW [4] FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	5	 max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz		560kHz	5102		

ECO6, Sys + PA with frame aerial, 070799

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

[1] If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

[2] RC network serves for damping the IF-filter while adjusting the other one.

[3] For AM RF adjustments the original frame antenna has to be used !

[4] MW has to be aligned before LW.

↕ Repeat

Electrical Partslist *ECO6* SYSTEMS NON-CENELEC

MISCELLANEOUS

1101	2422 015 19376	SOCKET 2P CLICKFIT	USA only
1102	4822 267 10283	SOCKET COAX, IEC 75Ω	not USA
1103	4822 265 31184	JST CONNECTOR 2 POLE	
1120	4822 265 11515	FFC SOCKET, 8P	

CAPACITORS

2101©	4822 126 13692	47pF	1%	63V	
2102©	4822 126 13838	100nF	10%	50V	not USA
2103©	5322 122 31647	1nF	10%	63V	
2104©	5322 122 32531	100pF	5%	50V	
2105©	4822 126 13838	100nF	10%	50V	USA only
2106	2020 800 00191	3-11pF TRIMCAP.,N450			
2107	4822 121 51319	1µF	20%	50V	
2120©	4822 126 13689	18pF	1%	63V	
2124©	5322 122 32654	22nF	10%	63V	
2125©	2020 552 96199	560pF	1%	50V	
2126©	5322 122 31863	330pF	5%	50V	
2127©	4822 126 14076	220nF	20%	25V	
2128	4822 124 40248	10µF	20%	63V	
2129	4822 124 41584	100µF	20%	10V	
2130©	5322 122 32654	22nF	10%	63V	
2131©	4822 126 13482	470nF	20%	16V	
2132©	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1µF	20%	63V	
2134©	4822 126 13188	15nF	5%	63V	not USA
2134©	5322 122 32654	22nF	10%	63V	USA only
2135©	4822 126 13188	15nF	5%	63V	not USA
2135©	5322 122 32654	22nF	10%	63V	USA only
2136©	4822 126 14076	220nF	20%	25V	
2137©	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2µF	20%	50V	
2139©	4822 126 14236	15pF	5%	50V	
2140©	4822 126 13695	82pF	1%	63V	
2141©	4822 126 13838	100nF	10%	50V	
2143©	4822 126 14076	220nF	20%	25V	
2144	4822 124 21913	1µF	20%	63V	
2145©	4822 122 33575	220pF	5%	50V	
2146©	4822 122 33575	220pF	5%	50V	
2147©	4822 122 33575	220pF	5%	50V	
2148©	4822 122 33127	2,2nF	10%	63V	
2149©	5322 122 32659	33pF	5%	50V	RDS only
2150©	4822 126 13838	100nF	10%	50V	
2152©	4822 126 12105	33nF	5%	63V	not for East Europe
2152©	5322 116 80853	560pF	5%	63V	for East Europe only
2153©	4822 126 13486	15pF	2%	63V	not for East Europe
2153©	4822 122 33926	12pF	2%	50V	for East Europe only
2155	2020 800 00191	3-11pF TRIMCAP.,N450			
2159©	5322 122 32659	33pF	5%	50V	
2164©	4822 126 13482	470nF	20%	16V	
2165©	4822 126 13838	100nF	10%	50V	
2166©	5322 122 31647	1nF	10%	63V	
2167©	4822 122 33926	12pF	5%	50V	
2169©	4822 122 33127	2,2nF	10%	63V	RDS only

RESISTORS

3101©	4822 051 20333	33kΩ	5%	0,1W	
3102©	4822 117 10837	100kΩ	1%	0,1W	
3103©	4822 051 20822	8,2kΩ	5%	0,1W	
3104©	4822 117 13577	330Ω	1%	0,1W	
3105©	4822 117 11503	220Ω	5%	0,1W	
3132©	4822 051 20479	47Ω	5%	0,1W	
3134©	4822 051 20223	22kΩ	5%	0,1W	
3141©	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			
3143©	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144©	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145©	4822 117 11449	2,2kΩ	1%	0,1W	
3146©	4822 051 20229	22Ω	5%	0,1W	
3152©	4822 051 20471	470Ω	5%	0,1W	
3153©	4822 051 20471	470Ω	5%	0,1W	
3154©	4822 117 13577	330Ω	1%	0,1W	
3155©	4822 117 11503	220Ω	5%	0,1W	
3156©	4822 117 10837	100kΩ	1%	0,1W	
3157©	4822 117 10837	100kΩ	1%	0,1W	
3158©	4822 051 20471	470Ω	5%	0,1W	
3159©	4822 051 20471	470Ω	5%	0,1W	
3160©	4822 051 20471	470Ω	5%	0,1W	
3161©	4822 051 20223	22kΩ	5%	0,1W	
3167©	4822 051 20121	120Ω	5%	0,1W	
3168©	4822 051 20121	120Ω	5%	0,1W	
3169©	4822 051 20154	150kΩ	5%	0,1W	
3170©	4822 117 10837	100kΩ	1%	0,1W	
3172©	4822 051 20562	5,6kΩ	5%	0,1W	
3176©	4822 051 20333	33kΩ	5%	0,1W	RDS only
3181©	4822 051 10102	1kΩ	2%	0,25W	
4103©	4822 051 20008	CHIP JUMPER 0805			
4106©	4822 051 20008	CHIP JUMPER 0805			
4107©	4822 051 20008	CHIP JUMPER 0805			
4108©	4822 051 20008	CHIP JUMPER 0805			

COILS

5102	4822 157 71634	RF-COIL MW
5109	4822 242 70665	FM-IF FILTER 10,7MHz
5110	4822 242 70665	FM-IF FILTER 10,7MHz
5111	2422 549 44023	AM-IF FILTER 450kHz
5112	4822 157 70302	AM-IF FILTER 450kHz
5114	4822 157 70302	AM-IF FILTER 450kHz
5119	4822 157 11443	DISCRIMINATOR COIL
5121	4822 242 10261	QUARTZ 75kHz
5123	2422 549 44108	RF-COIL, AM-OSCILLATOR
5130	4822 157 11843	RF COIL 1,5 TURNS
5131	4822 157 11843	RF COIL 1,5 TURNS

DIODES

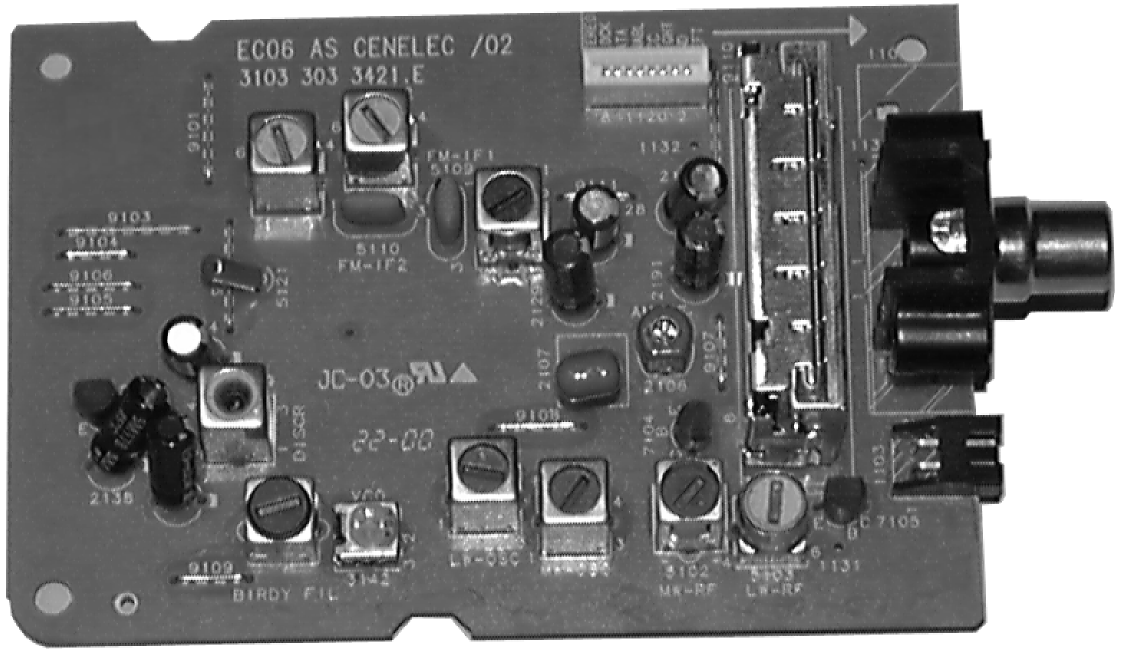
6103©	5322 130 34337	BAV99
6105©	4822 130 83075	HN1V02H
6106©	4822 130 83757	BAS216
6107©	9340 386 90115	BZX284-C11
6120©	4822 130 83757	BAS216
6130©	4822 130 82833	1SV228
6131©	4822 130 82833	1SV228

TRANSISTORS

7102	4822 130 42131	BF550	
7103©	5322 130 42756	BC857C	RDS only
7111©	5322 130 42755	BC847C	
7112	4822 130 44503	BC547C	

INTEGRATED CIRCUITS

7101©	9351 740 80557	TEA5757H/V1, RADIO IC


EC06 AS CENELEC /02
3103 303 3421.E
FM-IF1
FM-IF2
DISCR
JC-03
BIRDY FIL
LW-OSC
MW-RF
LW-RF

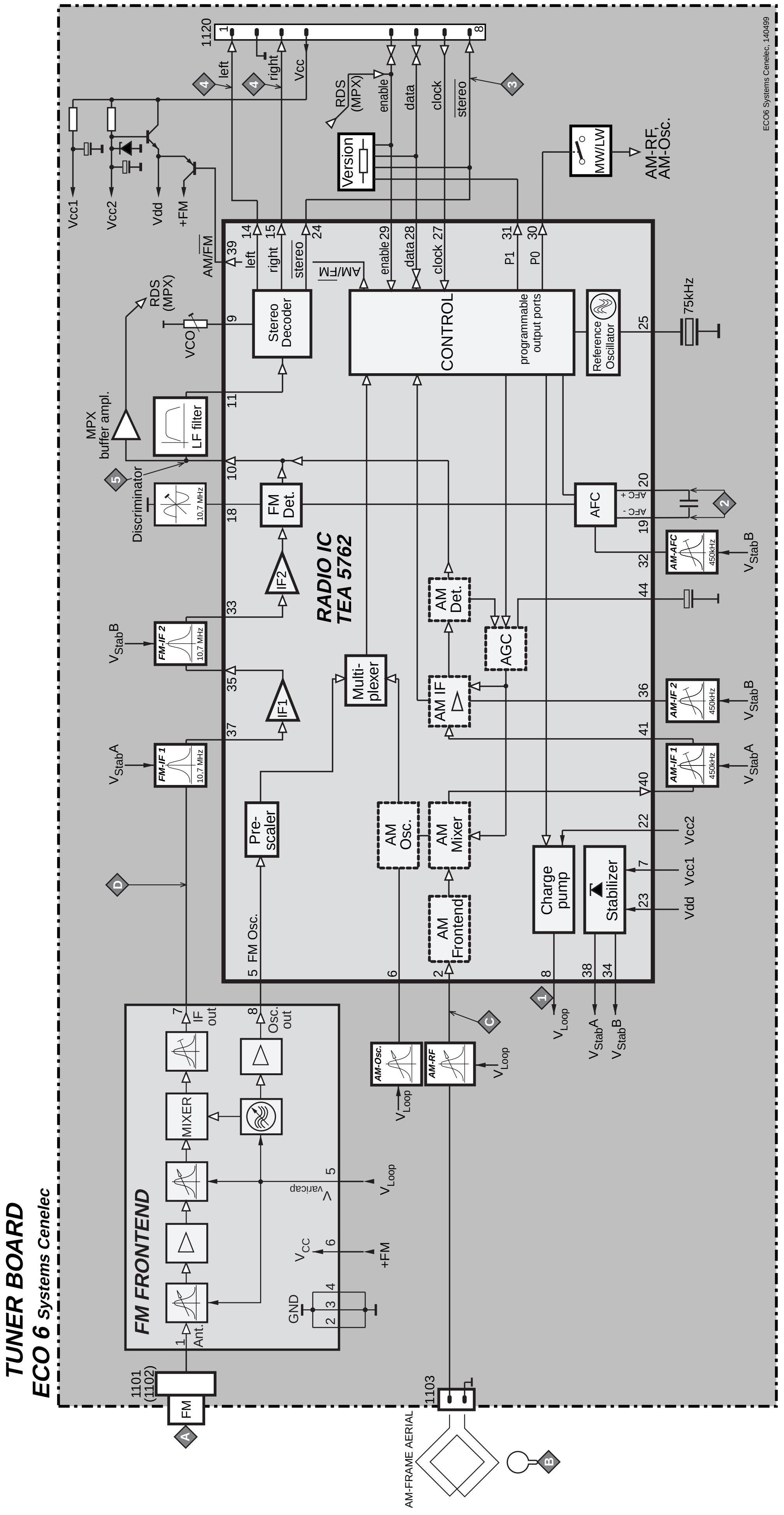
ECO6 Tuner Board

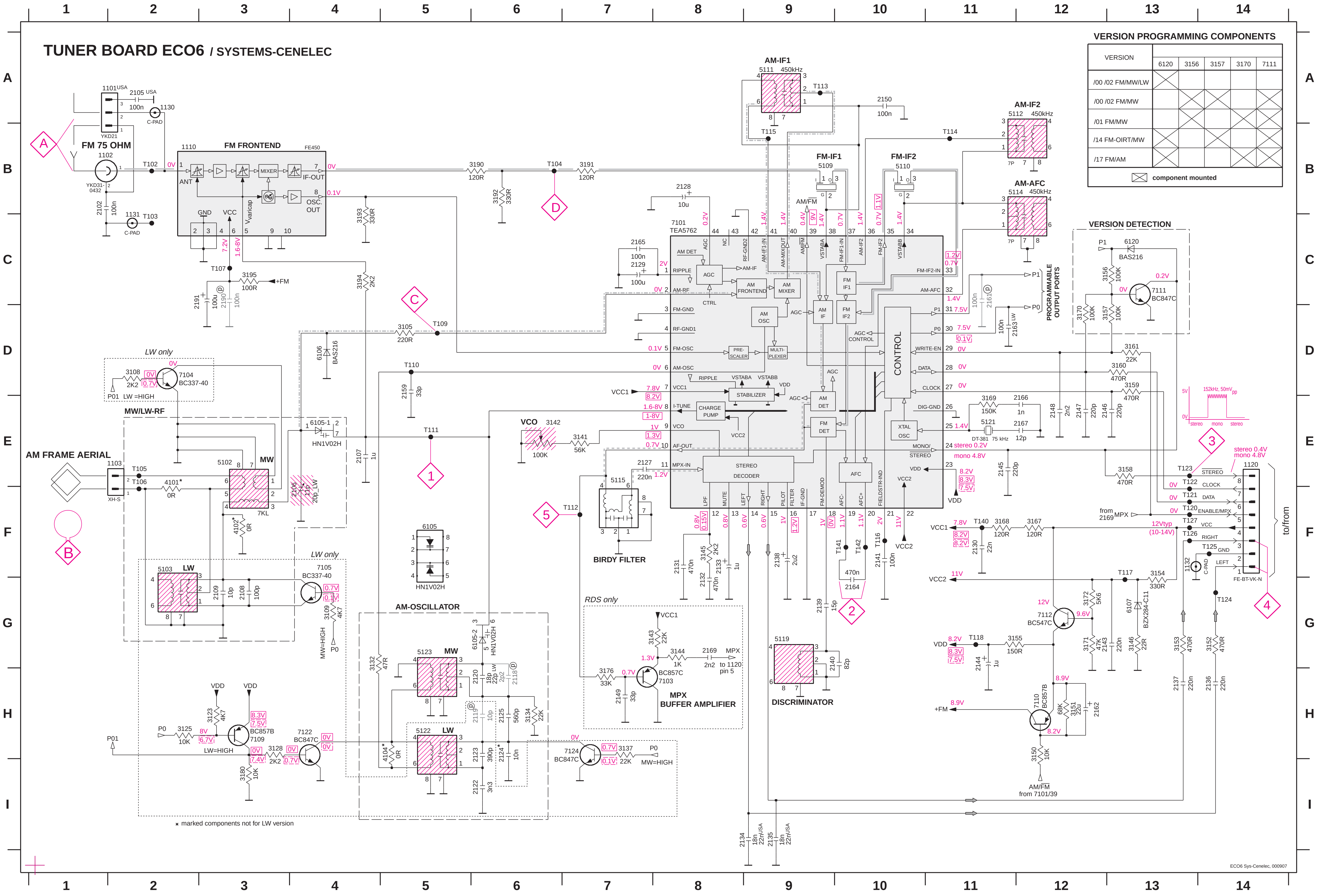
version: ***SYSTEMS CENELEC***

TABLE OF CONTENTS

Blockdiagram 7B-1
Schematic Diagram...7B-2
Component Layout..7B-3
Adjustment table 7B-3
Electrical Partslist..7B-4

BLOCK DIAGRAM


TUNER BOARD
ECO 6 Systems Cenelec
RADIO IC
TEA 5762
FM FRONTEND
CONTROL
programmable output ports
Reference Oscillator
Stereo Decoder
LF filter
MPX buffer ampl.
Discriminator
FM Det.
IF2
IF1
FM-IF 2
FM-IF 1
10,7 MHz
Pre-scaler
Multi-plexer
AM Det.
AM IF
AGC
AM Osc.
AM Mixer
AM Frontend
Charge pump
Stabilizer
AFC
AM-AFC
AM-IF 2
AM-IF 1
450kHz
AM-Osc.
AM-RF
MIXER
Version
MW/LW
AM-RF
AM-Osc.
75kHz
1120
left
right
Vcc
RDS (MPX)
enable
data
clock
stereo
Vcc1
Vcc2
Vdd
+FM
AM/FM
VCO
VStabA
VStabB
VLoop
Vvaricap
VCC
GND
Ant.
IF out
Osc. out
FM Osc.
1101 (1102)
1103
FM
AM-FRAME AERIAL
ECO6 Systems Cenelec 140499


TUNER BOARD ECO6 / SYSTEMS-CENELEC
FM 75 OHM
FM FRONTEND
FE450
AM FRAME AERIAL
LW only
MW/LW-RF
MW
LW
AM-OSCILLATOR
VCO
BIRDY FILTER
RDS only
MPX BUFFER AMPLIFIER
DISCRIMINATOR
AM-IF1
AM-IF2
AM-AFC
FM-IF1
FM-IF2
7101 TEA5762
STEREO DECODER
CONTROL
PROGRAMMABLE OUTPUT PORTS
VERSION DETECTION
FE-BT-VK-N
to/from
MW=HIGH
LW=HIGH
AM/FM from 7101/39
× marked components not for LW version
ECO6 Sys-Cenelec, 000907

VERSION PROGRAMMING COMPONENTS

VERSION	6120	3156	3157	3170	7111
/00 /02 FM/MW/LW	☒				
/00 /02 FM/MW		☒	☒		☒
/01 FM/MW		☒		☒	☒
/14 FM-OIRT/MW	☒		☒		☒
/17 FM/AM	☒			☒	☒

☒ component mounted

LEGEND

* ... only assembled in FM/AM-version
ⓟ...for provision only
USA ... for USA version only
LW ... for LW version only

SMD jumper
41xx
0R

Ⓥ EVM

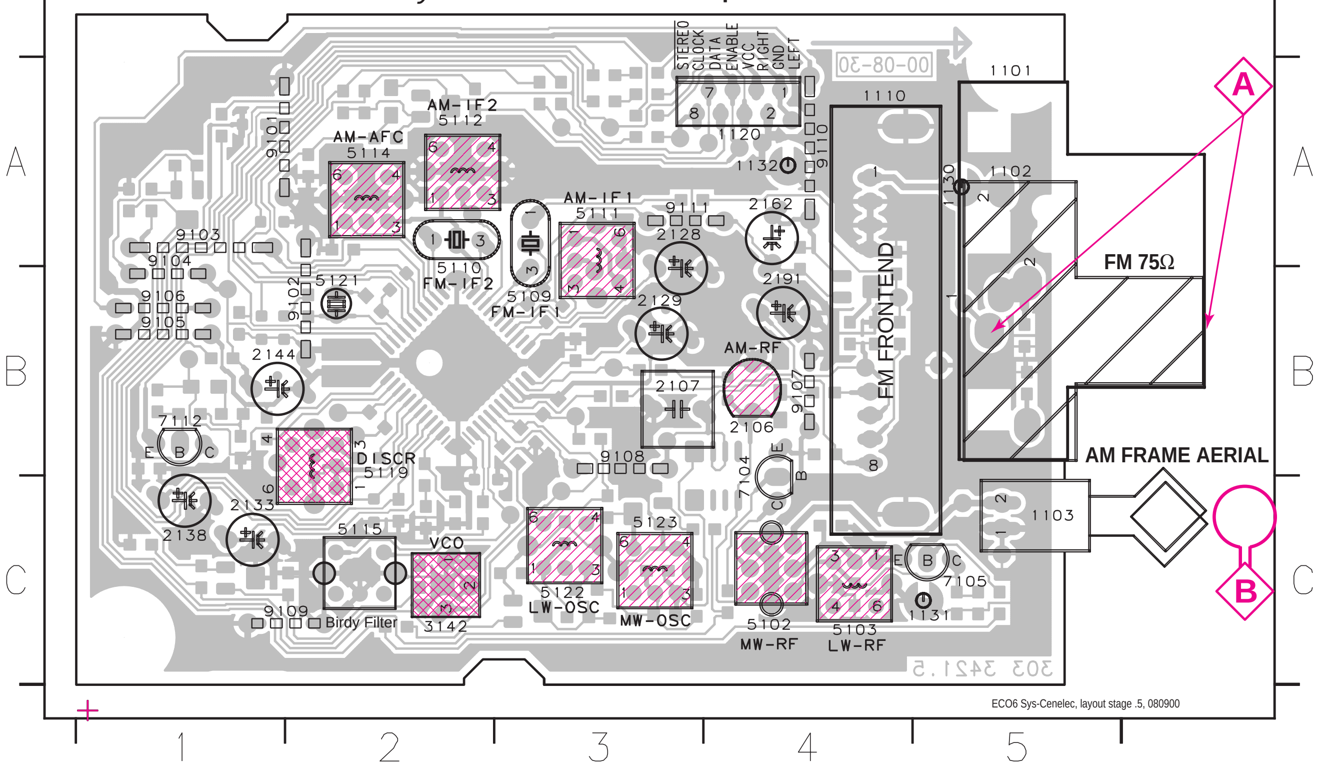
...V FM mode stereo
...V MW mode
...V LW mode
voltages measured while
set is tuned to a strong transmitter

Signal path
FM
AM
MPX (Audio Frequency)
AF - left/right

1101	A2	6106	D4
1102	B1	6107	G13
1103	E2	6120	C13
1110	B2	7101	C8
1120	E14	7103	H8
1130	A2	7104	D2
1131	C2	7105	F4
1132	F13	7109	H3
2102	B1	7110	H12
2105	A2	7111	C13
2106	E3	7112	G12
2107	E4	7122	H4
2108	G3	7124	H7
2109	G3	T102	B2
2118	H6	T103	B2
2119	H6	T104	B6
2120	H6	T105	E2
2122	I6	T106	E2
2123	H6	T107	C3
2124	H6	T109	D5
2125	H6	T110	D5
2127	E7	T111	E5
2128	B8	T112	F7
2129	C7	T113	A9
2130	F11	T114	B11
2131	F8	T116	F10
2132	F8	T117	F13
2133	F8	T118	G11
2134	I8	T120	F13
2135	I9	T121	F13
2136	H14	T122	E13
2137	H13	T123	E13
2138	F9	T124	G14
2139	G9	T125	F14
2140	G9	T126	F13
2141	F10	T127	F13
2143	G12	T140	F11
2144	G11	T141	F10
2145	E11	T142	F10
2146	E12		
2147	E12		
2148	E12		
2149	H7		
2150	A10		
2159	D5		
2161	C11		
2162	H12		
2163	D11		
2164	G10		
2165	C7		
2166	E11		
2167	E11		
2169	G8		
2190	C3		
2191	C3		
3105	D5		
3108	D2		
3109	G4		
3123	H3		
3125	H2		
3128	H3		
3132	G4		
3134	H6		
3137	H7		
3141	E7		
3142	E6		
3143	G7		
3144	G8		
3145	F8		
3146	G13		
3150	H12		
3151	H12		
3152	G14		
3153	G13		
3154	F13		
3155	G12		
3156	C12		
3157	D12		
3158	E13		
3159	D13		
3160	D13		
3161	D13		
3167	F12		
3168	F11		
3169	E11		
3170	D12		
3171	G12		
3172	G12		
3176	H7		
3180	I3		
3190	B6		
3191	B7		
3192	B6		
3193	B4		
3194	C4		
3195	C3		
4101	E2		
4102	F3		
4104	H5		
5102	E3		
5103	F2		
5109	B9		
5110	B10		
5111	A9		
5112	A11		
5114	B11		
5115	E7		
5119	G9		
5121	E11		
5122	H5		
5123	G5		
6105-1	E4		
6105-2	G6		

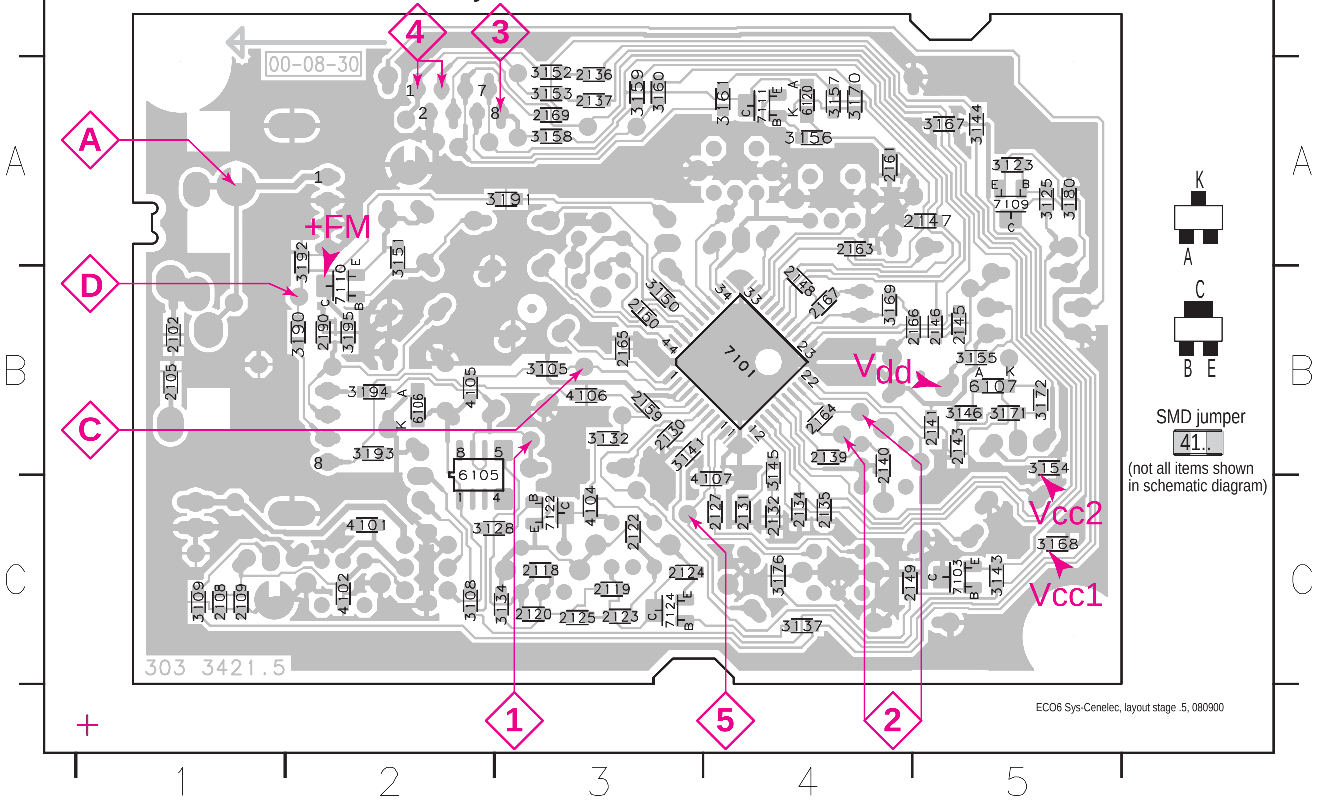
1101	B5	1110	B4	1131	C5	2107	B3	2133	C1	2162	A4	5102	C4	5110	A2	5114	A2	5121	B2	7104	C4	9101	A2	9104	B1	9107	B4	9110	A4
1102	B5	1120	A4	1132	A4	2128	A3	2138	B1	2191	B4	5103	C4	5111	A3	5115	C2	5122	C3	7105	C5	9102	B2	9105	B1	9108	B3	9111	A3
1103	C5	1130	A5	2106	B4	2129	B3	2144	B1	3142	C2	5109	B3	5112	A2	5119	B2	5123	C3	7112	B1	9103	A1	9106	B1	9109	C2		

TUNER BOARD ECO6 *Systems - Cenelec* / componentside view


1
2
3
4
5
A
B
C
STEREO
CLOCK
DATA
ENABLE
VCC
RIGHT
GND
LEFT
00-08-30
1101
1110
AM-IF2
5112
AM-AFC
5114
9101
1120
1132
9110
1130
1102
AM-IF1
5111
9111
2162
9103
5110
FM-IF2
2128
9104
5109
FM-IF1
2191
FM FRONTEND
FM 75Ω
9102
5121
2129
9106
9105
2144
AM-RF
2107
2106
9107
7112
E B C
DISCR
5119
9108
7104
AM FRAME AERIAL
2133
2138
5115
5123
1103
VCO
5122
LW-OSC
MW-OSC
5102
MW-RF
5103
LW-RF
7105
1131
9109
Birdy Filter
3142
303 3421.5
A
B
ECO6 Sys-Cenelec, layout stage .5, 080900

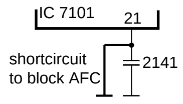
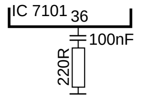
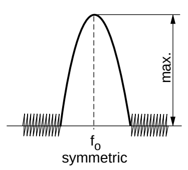
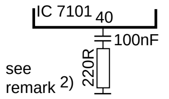
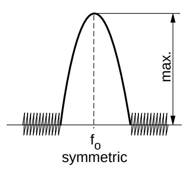
2102	B1	2120	C3	2130	B3	2137	A3	2146	B5	2161	A4	2169	A3	3125	A5	3143	C5	3152	A3	3158	A3	3169	B4	3190	B2	4101	C2	6105	B2	7109	A5
2105	B1	2122	C3	2131	C4	2139	B4	2147	A5	2163	A4	2190	B2	3128	C2	3144	A5	3153	A3	3159	A3	3170	A4	3191	A3	4102	C2	6106	B2	7110	B2
2108	C1	2123	C3	2132	C4	2140	B4	2148	B4	2164	B4	3105	B3	3132	B3	3145	C4	3154	B5	3160	A3	3171	B5	3192	A2	4104	C3	6107	B5	7111	A4
2109	C1	2124	C3	2134	C4	2141	B5	2149	C4	2165	B3	3108	C2	3134	C3	3146	B5	3155	B5	3161	A4	3172	B5	3193	B2	4105	B2	6120	A4	7122	C3
2118	C3	2125	C3	2135	C5	2143	B5	2150	B3	2166	B5	3109	C1	3137	C4	3150	B3	3156	A4	3167	A5	3176	C4	3194	B2	4106	B3	7101	B4	7124	C3
2119	C3	2127	C4	2136	A3	2145	B5	2159	B3	2167	B4	3123	A5	3141	B3	3151	A2	3157	A4	3168	C5	3180	A5	3195	B2	4107	C4	7103	C5		

TUNER BOARD ECO6 *Systems - Cenelec* / copperside view


1
2
3
4
5
A
B
C
4
3
00-08-30
3152
3136
3153
3137
2169
3158
3159
3160
3161
6120
3157
3170
3156
3167
3144
A
D
+FM
3191
2161
3123
3109
3125
3180
2147
2163
C
3192
3151
7101
2102
2105
3190
2190
3195
Vdd
3105
4106
3155
6107
3146
3171
3172
3194
3193
6105
3132
2139
2140
3154
Vcc2
4107
3168
Vcc1
4101
3128
2118
2124
2119
2120
2125
2123
3137
3109
2108
2109
4102
3108
3134
303 3421.5
1
5
2
K
A
C
B E
SMD jumper
41..
(not all items shown in schematic diagram)
ECO6 Sys-Cenelec, layout stage .5, 080900

These assembly drawings show a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

TUNER ADJUSTMENT TABLE (ECO6 Cenelec FM/MW - and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check	1	8V ±1.2V
			87.5MHz	check		1.6V ±0.5V
MW 531 - 1602kHz (9kHz grid)			1602kHz	5123		8V ±0.2V 3-band 6.9V ±0.2V 2-band
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz (3kHz grid)			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
FM - IF						
FM	10.7MHz, 45mV continuous wave	D	 IC 7101 21 2141shortcircuit to block AFC	5119	2	0mV ±3mV
FM - VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz 1)
FM RF (channel separation)	Note: The FM-frontend unit has already been adjusted by the factory and needs therefore no further adjustments for service purposes.					
FM	98MHz, 1mV 90% Left + 9% pilot mod=1kHz	A	98MHz	IF coil inside FM frontend 1110	4	right channel min.
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	C Δf = ±10kHz V_{RF} = 0.5mV (as low as possible)	 IC 7101 36 100nF 220R	5111	5	 max. f_o symmetric
			 IC 7101 40 100nF 220Rsee remark 2)	5112		
AM AFC **MW**		C continuous wave V_{RF} = 2mV		5114	2	0mV ±2mV
AM RF 3)						
MW	1494kHz	B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	5	 max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		

ECO6 Sys Cenelec, 190599

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

2) RC network serves for damping the IF-filter while adjusting the other one.

3) For AM RF adjustments the original frame antenna has to be used! MW has to be aligned before LW.

↕ Repeat

Electrical Partslist *ECO6* *SYSTEMS-CENELEC*

MISCELLANEOUS

1101	2422 015 19376	SOCKET CLICKFIT 2P	USA only
1102	4822 267 10283	SOCKET COAX, IEC 75Ω	not USA
1103	4822 265 31184	JST CONNECTOR, 2 POLE	
1110	2422 542 90071	FM FRONTEND	
1120	4822 265 11515	FFC SOCKET, 8P	

CAPACITORS

2102©	4822 126 13838	100nF	10%	50V	not USA
2105©	4822 126 13838	100nF	10%	50V	USA only
2106	2020 800 00204	TRIMCAP. 4,2 - 20pF, N750			LW only
2106	2020 800 00191	TRIMCAP. 3 - 11pF, N450			FM/AM only
2107	4822 121 51319	1µF	20%	50V	
2108©	5322 122 32531	100pF	5%	50V	LW only
2109©	5322 122 32448	10pF	5%	50V	LW only
2120©	4822 126 13689	18pF	1%	63V	FM/AM only
2120©	5322 122 32658	22pF	5%	50V	LW only
2122©	4822 122 33891	3,3nF	10%	63V	LW only
2123©	2020 552 93494	390pF	1%	50V	LW only
2124©	4822 122 33177	10nF	20%	50V	FM/AM only
2125©	2020 552 96199	560pF	1%	50V	
2127©	4822 126 14076	220nF	20%	25V	
2128	4822 124 40248	10µF	20%	63V	
2129	4822 124 41584	100µF	20%	10V	
2130©	5322 122 32654	22nF	10%	63V	
2131©	4822 126 13482	470nF	20%	16V	
2132©	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1µF	20%	63V	
2134©	4822 122 33893	18nF	5%	63V	not USA
2134©	5322 122 32654	22nF	10%	63V	USA only
2135©	4822 122 33893	18nF	5%	63V	not USA
2135©	5322 122 32654	22nF	10%	63V	USA only
2136©	4822 126 14076	220nF	20%	25V	
2137©	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2µF	20%	50V	
2139©	4822 126 14236	15pF	5%	50V	
2140©	4822 126 13695	82pF	1%	63V	
2141©	4822 126 13838	100nF	10%	50V	
2143©	4822 126 14076	220nF	20%	25V	
2144	4822 124 21913	1µF	20%	63V	
2145©	4822 122 33575	220pF	5%	50V	
2146©	4822 122 33575	220pF	5%	50V	
2147©	4822 122 33575	220pF	5%	50V	
2148©	4822 122 33127	2,2nF	10%	63V	
2149©	5322 122 32659	33pF	5%	50V	RDS only
2150©	4822 126 13838	100nF	10%	50V	
2159©	5322 122 32659	33pF	5%	50V	
2162	4822 124 81151	22µF	20%	50V	
2163©	4822 126 13838	100nF	10%	50V	LW only
2164©	4822 126 13482	470nF	20%	16V	
2165©	4822 126 13838	100nF	10%	50V	
2166©	5322 122 31647	1nF	10%	63V	
2167©	4822 122 33926	12pF	5%	50V	
2169©	4822 122 33127	2,2nF	10%	63V	RDS only
2190©	4822 126 13838	100nF	10%	50V	
2191	4822 124 40178	100µF	20%	10V	

RESISTORS

3105©	4822 117 11503	220Ω	5%	0,1W	
3108©	4822 117 11449	2,2kΩ	1%	0,1W	LW only
3109©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3123©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3125©	4822 117 10833	10kΩ	1%	0,1W	LW only
3128©	4822 117 11449	2,2kΩ	1%	0,1W	LW only

RESISTORS

3132©	4822 051 20479	47Ω	5%	0,1W	
3134©	4822 051 20223	22kΩ	5%	0,1W	
3137©	4822 051 20223	22kΩ	5%	0,1W	LW only
3141©	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			
3143©	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144©	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145©	4822 117 11449	2,2kΩ	1%	0,1W	
3146©	4822 051 20229	22Ω	5%	0,1W	
3150©	4822 117 10833	10kΩ	1%	0,1W	
3151©	4822 051 20683	68kΩ	5%	0,1W	
3152©	4822 051 20471	470Ω	5%	0,1W	
3153©	4822 051 20471	470Ω	5%	0,1W	
3154©	4822 117 13577	330Ω	1%	0,1W	
3155©	4822 117 10353	150Ω	5%	0,1W	
3156©	4822 117 10837	100kΩ	1%	0,1W	
3157©	4822 117 10837	100kΩ	1%	0,1W	
3158©	4822 051 20471	470Ω	5%	0,1W	
3159©	4822 051 20471	470Ω	5%	0,1W	
3160©	4822 051 20471	470Ω	5%	0,1W	
3161©	4822 051 20223	22kΩ	5%	0,1W	
3167©	4822 051 20121	120Ω	5%	0,1W	
3168©	4822 051 20121	120Ω	5%	0,1W	
3169©	4822 051 20154	150kΩ	5%	0,1W	
3170©	4822 117 10837	100kΩ	1%	0,1W	
3171©	4822 117 10834	47kΩ	1%	0,1W	
3172©	4822 051 20562	5,6kΩ	5%	0,1W	
3176©	4822 051 20333	33kΩ	5%	0,1W	RDS only
3180©	4822 117 10833	10kΩ	1%	0,1W	LW only
3190©	4822 051 20121	120Ω	5%	0,1W	
3191©	4822 051 20121	120Ω	5%	0,1W	
3192©	4822 117 13577	330Ω	1%	0,1W	
3193©	4822 117 13577	330Ω	1%	0,1W	
3194©	4822 117 11449	2,2kΩ	1%	0,1W	
3195©	4822 051 20101	100Ω	5%	0,1W	
4101©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4102©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4104©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4105©	4822 051 20008	CHIP JUMPER 0805			
4106©	4822 051 20008	CHIP JUMPER 0805			
4107©	4822 051 20008	CHIP JUMPER 0805			

COILS

5102	4822 157 71634	RF-COIL MW	
5103	2422 549 44107	RF-COIL LW	LW only
5109	4822 157 71639	FM-IF FILTER 10,7MHz	
5110	4822 242 70665	FM-IF FILTER 10,7MHz	
5111	2422 549 44023	AM-IF FILTER 450kHz	
5112	4822 157 70302	AM-IF FILTER 450kHz	
5114	4822 157 70302	AM-IF FILTER 450kHz	
5115	4822 157 71636	ANTI BIRDY FILTER	
5119	4822 157 11443	DISCRIMINATOR COIL	
5121	4822 242 10261	QUARTZ 75kHz	
5122	2422 549 44108	RF-COIL, LW-OSCILLATOR	LW only
5123	2422 549 44108	RF-COIL, MW-OSCILLATOR	

DIODES

6105©	4822 130 83075	HN1V02H
6106©	4822 130 83757	BAS216
6107©	9340 386 90115	BZX284-C11
6120©	4822 130 83757	BAS216

TRANSISTORS

7103©	5322 130 42756	BC857C	RDS only
7104	9322 003 64676	TBC337-40	LW only
7105	9322 003 64676	TBC337-40	LW only
7109©	4822 130 60373	BC856B	LW only
7110©	4822 130 60373	BC856B	
7111©	5322 130 42755	BC847C	
7112	4822 130 44503	BC547C	
7122©	5322 130 42755	BC847C	LW only
7124©	5322 130 42755	BC847C	LW only

INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1, RADIO IC

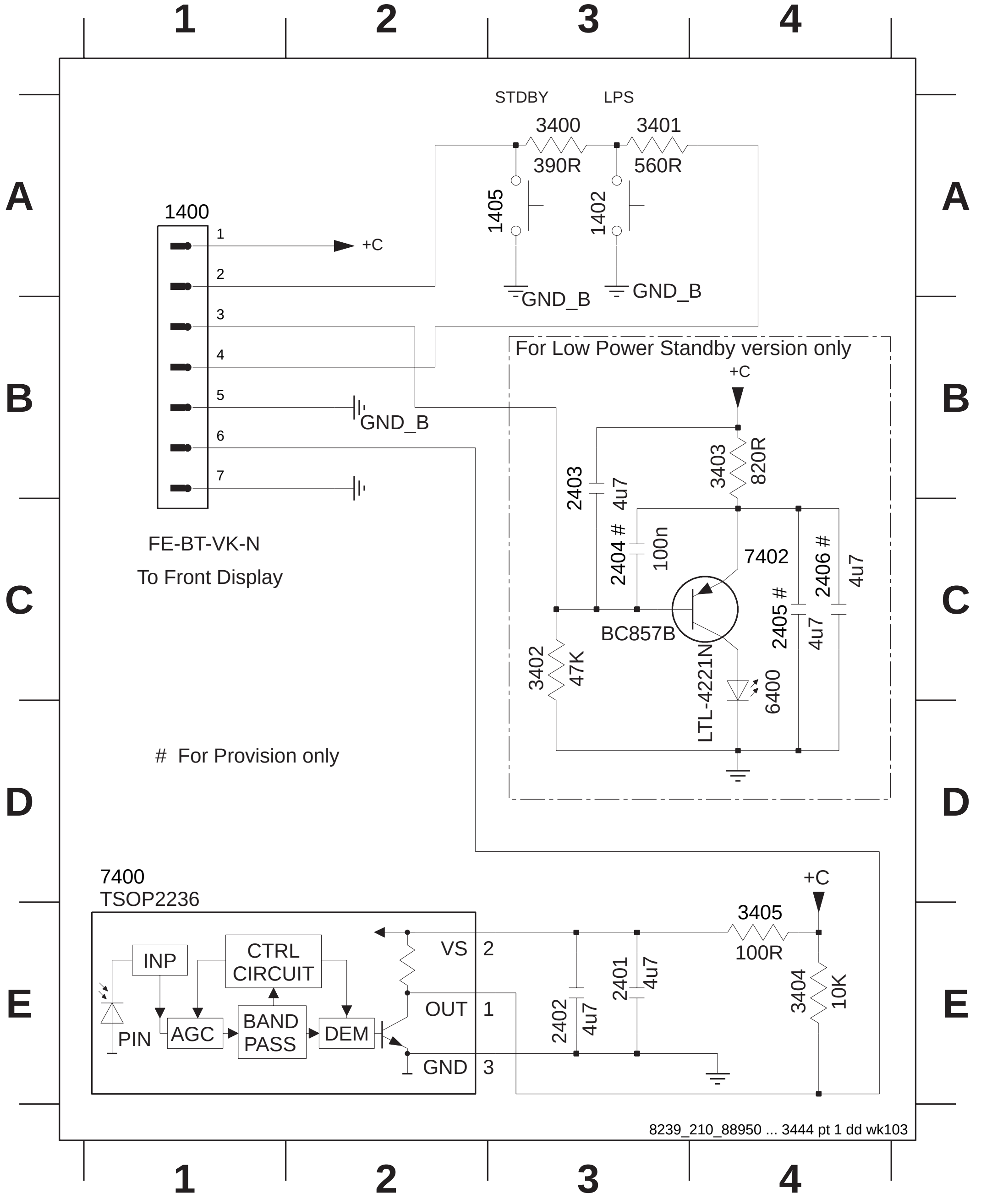
FRONT CONTROL BOARD

TABLE OF CONTENTS

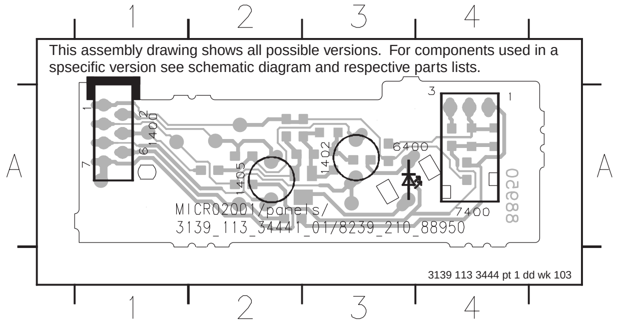
Standby (Power) part 8-1
Key Control (KEYB. 1) & Lightwash parts 8-2
Headphone, Jog (Volume) and CDC Key parts 8-3
Electrical parts list 8-4

STANDBY (POWER) PART - CIRCUIT & LAYOUTS

1400 A1	**2401 E3**	**2404 C3**	**3400 A3**	**3403 B4**	**6400 C4**
1402 A3	**2402 E3**	**2405 C4**	**3401 A3**	**3404 E4**	**7400 D1**
1405 A2	**2403 B3**	**2406 C4**	**3402 C3**	**3405 E4**	**7402 C4**

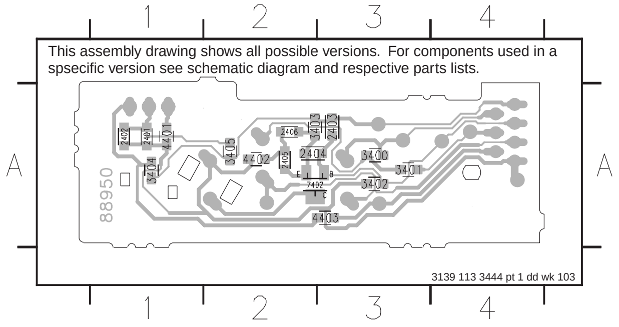

1
2
3
4
A
B
C
D
E
STDBY
LPS
3400
390R
3401
560R
1405
1402
GND_B
GND_B
1400
1
2
3
4
5
6
7
+C
GND_B
FE-BT-VK-N
To Front Display
For Low Power Standby version only
+C
3403
820R
2403
4u7
2404 #
100n
7402
BC857B
2406 #
4u7
2405 #
4u7
3402
47K
LTL-4221N
6400
# For Provision only
7400
TSOP2236
INP
CTRL CIRCUIT
AGC
BAND PASS
DEM
PIN
VS 2
OUT 1
GND 3
2402
4u7
2401
4u7
+C
3405
100R
3404
10K
8239_210_88950 ... 3444 pt 1 dd wk103

1400 A1	1402 A3	1405 A2	6400 A3	7400 A4


1
2
3
4
A
1400
1405
1402
6400
7400
MICRO2001/panels/
3139_113_34441_01/8239_210_88950
88950
3139 113 3444 pt 1 dd wk 103

This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.

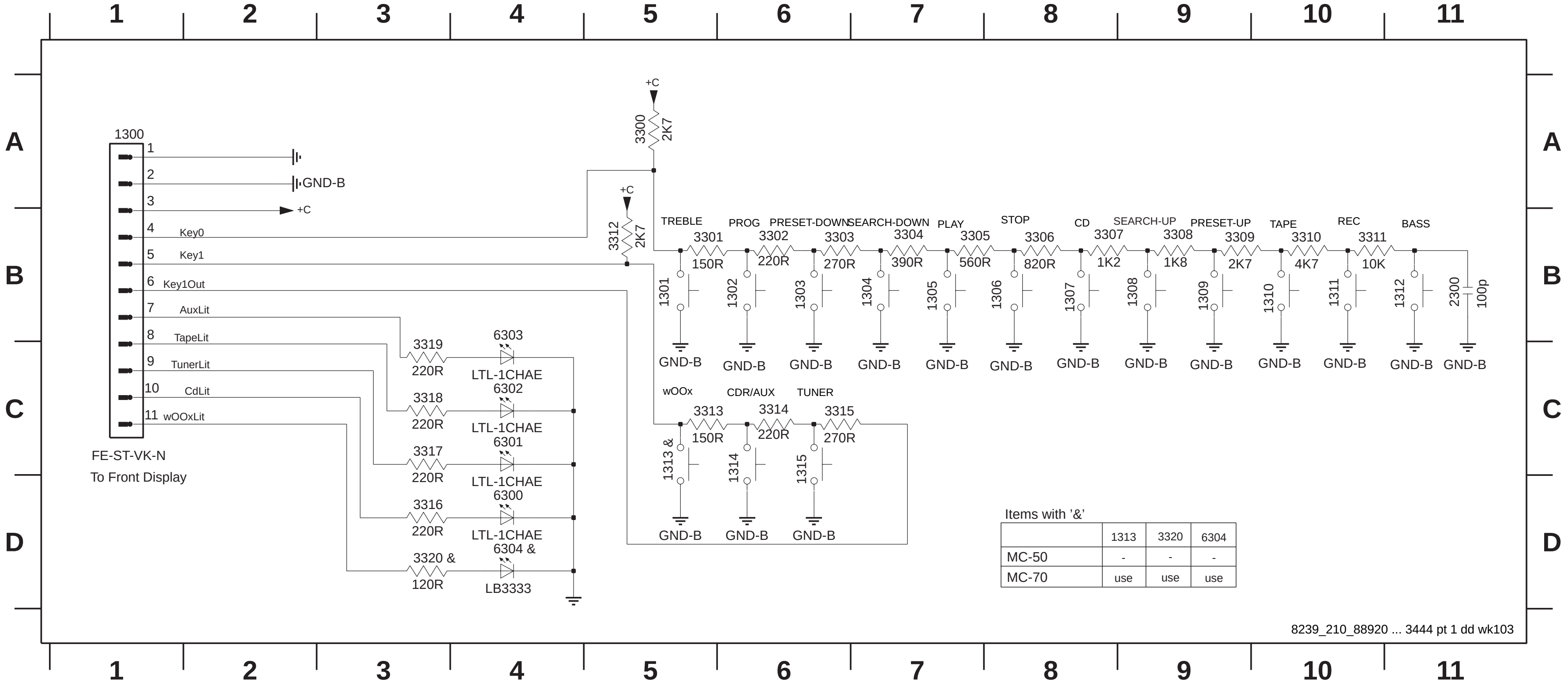
2401 A1	2405 A2	3402 A3	4401 A1
2402 A1	2406 A2	3403 A2	4402 A2
2403 A3	3400 A3	3404 A1	4403 A3
2404 A2	3401 A3	3405 A2	7402 A2


1
2
3
4
A
88950
3400
3401
3402
3139 113 3444 pt 1 dd wk 103

This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.

KEY CONTROL (KEYB. 1) PART - CIRCUIT & LAYOUT DIAGRAMS

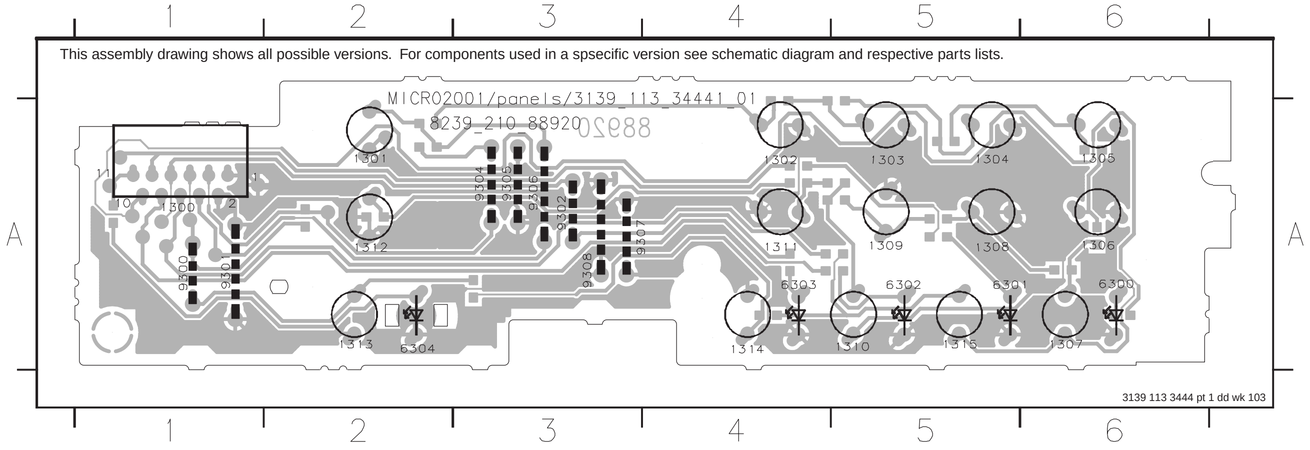
1300 A1
1301 B5
1302 B6
1303 B6
1304 B7
1305 B7
1306 B8
1307 B8
1308 B9
1309 B9
1310 B10
1311 B10
1312 B11
1313 C5
1314 D6
1315 D6
2300 B11
3300 A5
3301 B5
3302 B6
3303 B6
3304 B7
3305 B7
3306 B8
3307 B8
3308 B9
3309 B9
3310 B10
3311 B10
3312 B5
3313 C5
3314 C6
3315 C6
3316 D3
3317 C3
3318 C3
3319 C3
3320 D3
6300 D4
6301 C4
6302 C4
6303 B4
6304 D4


1300
1 2 3 4 5 6 7 8 9 10 11
GND-B
+C
Key0
Key1
Key1Out
AuxLit
TapeLit
TunerLit
CdLit
wOOxLit
FE-ST-VK-N
To Front Display
3300 2K7
3312 2K7
TREBLE
PROG
PRESET-DOWN
SEARCH-DOWN
PLAY
STOP
CD
SEARCH-UP
PRESET-UP
TAPE
REC
BASS
3301 150R
3302 220R
3303 270R
3304 390R
3305 560R
3306 820R
3307 1K2
3308 1K8
3309 2K7
3310 4K7
3311 10K
1301
1302
1303
1304
1305
1306
1307
1308
1309
1310
1311
1312
2300 100p
GND-B
wOOx
CDR/AUX
TUNER
3313 150R
3314 220R
3315 270R
1313 &
1314
1315
3319 220R
3318 220R
3317 220R
3316 220R
3320 & 120R
6303 LTL-1CHAE
6302 LTL-1CHAE
6301 LTL-1CHAE
6300 LTL-1CHAE
6304 & LB3333
A B C D
8239_210_88920 ... 3444 pt 1 dd wk103

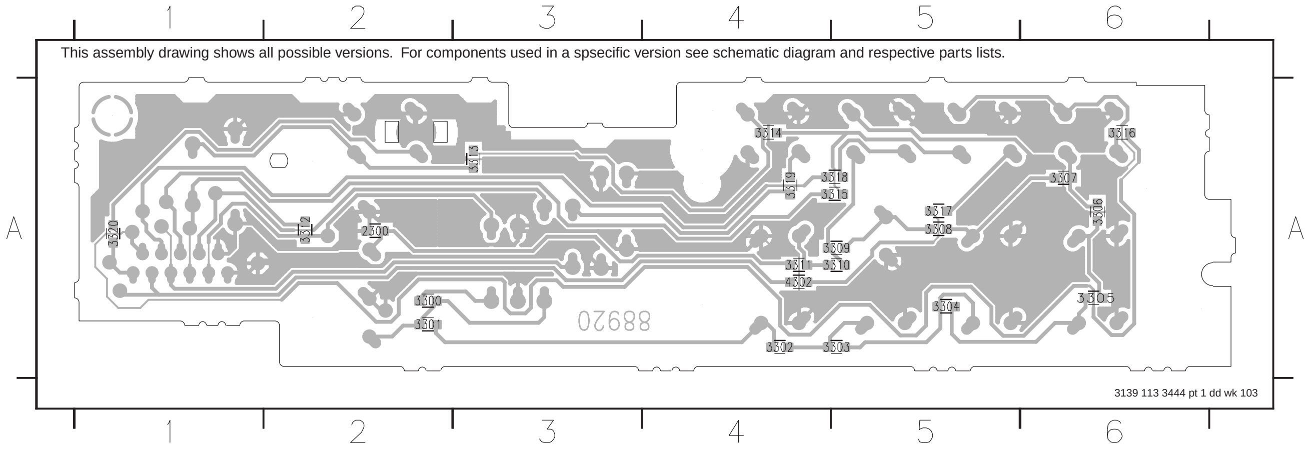
Items with ’&’

	1313	3320	6304
MC-50	-	-	-
MC-70	use	use	use

1300 A1
1301 A2
1302 A4
1303 A5
1304 A5
1305 A6
1306 A6
1307 A6
1308 A5
1309 A5
1310 A5
1311 A4
1312 A2
1313 A2
1314 A4
1315 A5
6300 A6
6301 A5
6302 A5
6303 A4
6304 A2
9300 A1
9301 A1
9302 A3
9304 A3
9305 A3
9306 A3
9307 A3
9308 A3

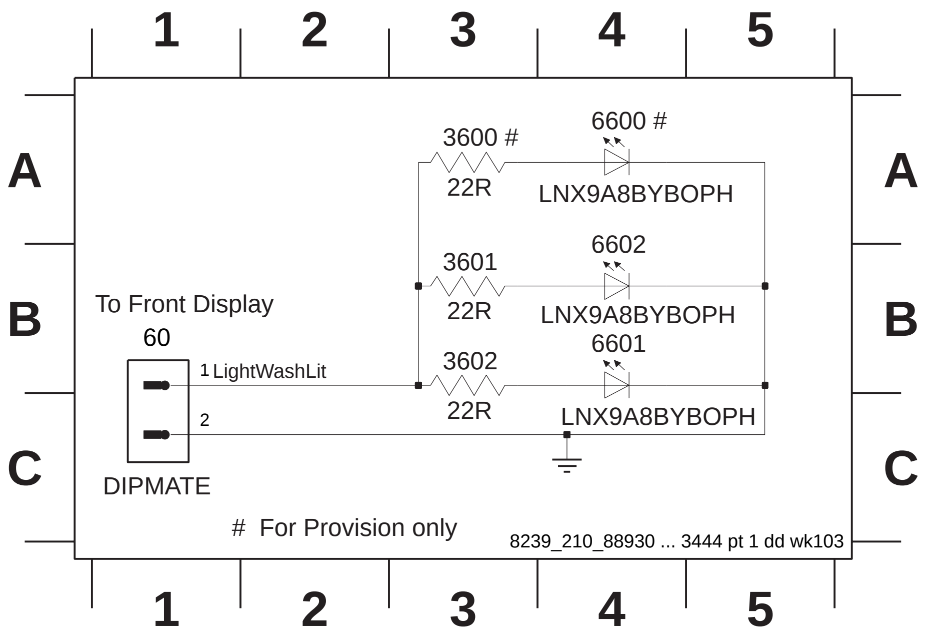

This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.
1 2 3 4 5 6
A
MICRO2001/panels/3139_113_34441_01
8239_210_88920
1300
1301
1302
1303
1304
1305
1306
1307
1308
1309
1310
1311
1312
1313
1314
6300
6301
6302
6303
6304
3139 113 3444 pt 1 dd wk 103

2300 A2
3300 A2
3301 A2
3302 A4
3303 A5
3304 A5
3305 A6
3306 A6
3307 A6
3308 A5
3309 A5
3310 A5
3311 A4
3312 A2
3313 A3
3314 A4
3315 A5
3316 A6
3317 A5
3318 A5
3319 A4
3320 A1
4302 A4

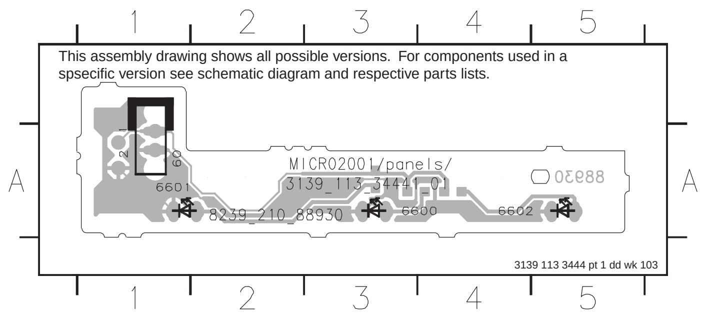

This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.
1 2 3 4 5 6
A
88920
3139 113 3444 pt 1 dd wk 103

LIGHTWASH PART - CIRCUIT & LAYOUT DIAGRAMS

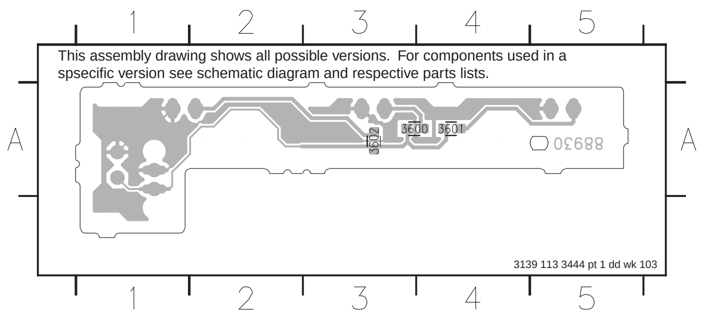
60 B1
3600 A3
3601 B3
3602 B3
6600 A4
6601 B4
6602 B4


1 2 3 4 5
A B C
3600 # 22R
6600 # LNX9A8BYBOPH
3601 22R
6602 LNX9A8BYBOPH
3602 22R
6601 LNX9A8BYBOPH
To Front Display
60
1 LightWashLit
2
DIPMATE
# For Provision only
8239_210_88930 ... 3444 pt 1 dd wk103

60 A1
6600 A4
6601 A1
6602 A4

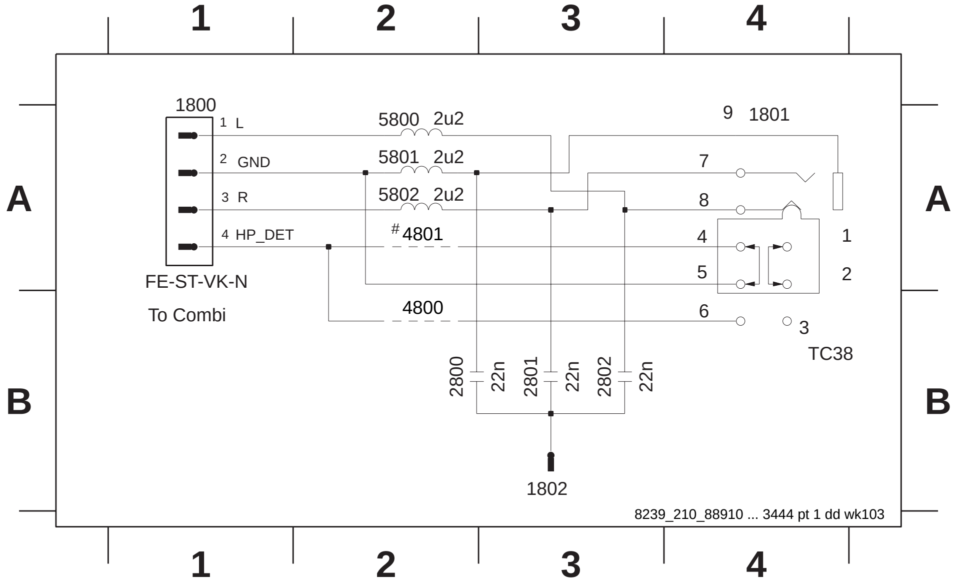

This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.
1 2 3 4 5
A
MICRO2001/panels/
3139_113_34441_01
8239_210_88930
60
6600
6601
6602
88930
3139 113 3444 pt 1 dd wk 103

3600 A3
3601 A4
3602 A3

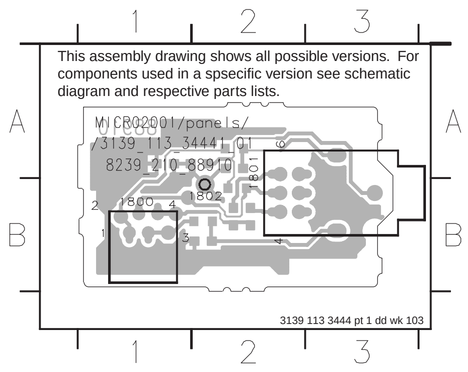

This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.
1 2 3 4 5
A
3600
3601
3602
88930
3139 113 3444 pt 1 dd wk 103

HEADPHONE PART - CIRCUIT & LAYOUT DIAGRAMS

1800 A1	1802 B3	2801 B3	4800 B2	5800 A2	5802 A2
1801 A4	2800 B2	2802 B3	4801 A2	5801 A2	

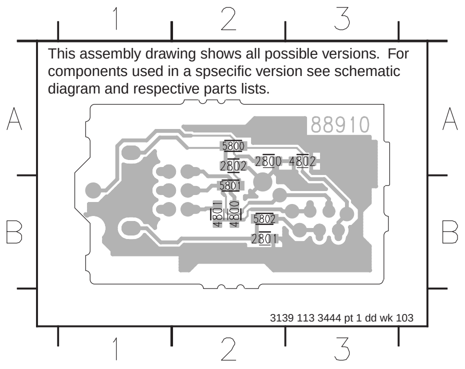

1
2
3
4
A
B
1800
1 L
2 GND
3 R
4 HP_DET
FE-ST-VK-N
To Combi
5800 2u2
5801 2u2
5802 2u2
#4801
4800
9 1801
7
8
4
5
6
1
2
3
TC38
2800 22n
2801 22n
2802 22n
1802
8239_210_88910 ... 3444 pt 1 dd wk103

1800 B1 1801 A2 1802 B2


1
2
3
A
B
MICRO2001/panels/
3139_113_3444_01
8239_210_88910
1800
1802
3139 113 3444 pt 1 dd wk 103

This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.

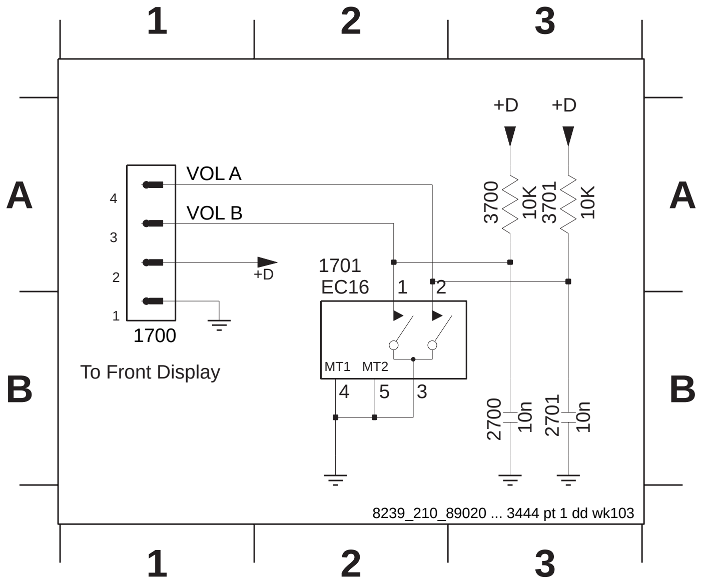
2800 A2 2802 A2 4801 B2 5800 A2 5802 B2
2801 B2 4800 B2 4802 A3 5801 B2


1
2
3
A
B
88910
2800
2802
4802
2801
3139 113 3444 pt 1 dd wk 103

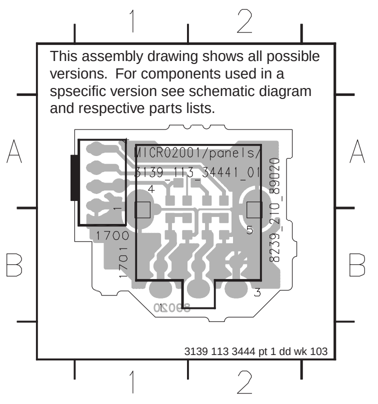
This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.

JOG (VOLUME) PART - CIRCUIT & LAYOUT DIAGRAMS

1700 B1	1701 A2	2700 B3	2701 B3	3700 A3	3701 A3

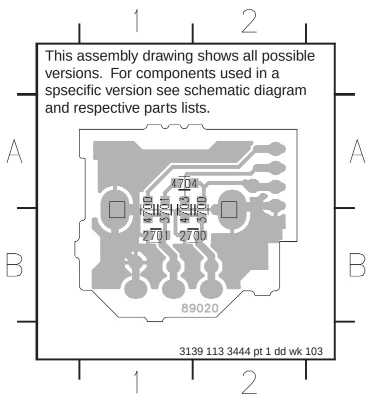

1
2
3
A
B
VOL A
VOL B
4
3
2
1
1700
To Front Display
+D
1701
EC16
1 2
MT1 MT2
4 5 3
+D
+D
3700 10K
3701 10K
2700 10n
2701 10n
8239_210_89020 ... 3444 pt 1 dd wk103

1700 B1 1701 B1


1
2
A
B
MICRO2001/panels/
3139_113_34441_01
8239_210_89020
1700
1701
3139 113 3444 pt 1 dd wk 103

This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.

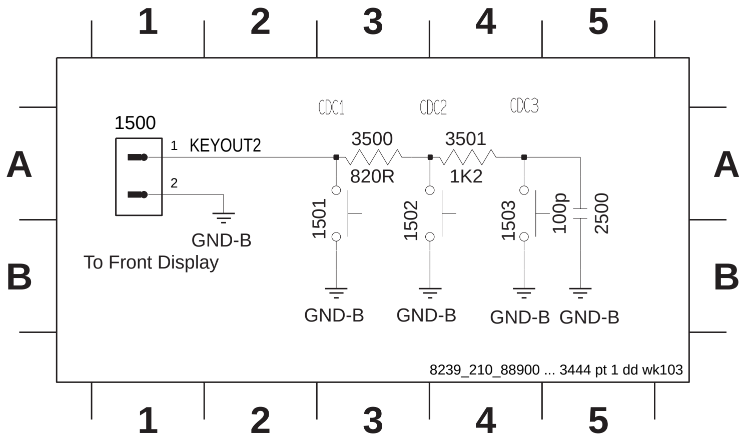
2700 B2 3700 B2 4700 B1 4704
2701 B1 3701 B1 4703 B1


1
2
A
B
2701
2700
89020
3139 113 3444 pt 1 dd wk 103

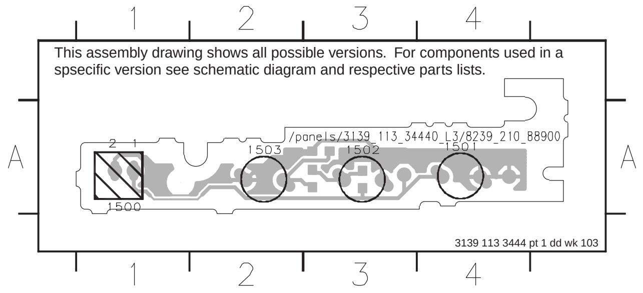
This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.

CDC KEY PART - CIRCUIT & LAYOUT DIAGRAMS

1500 A1	1502 B3	2500 A5	3501 A4
1501 B2	1503 B4	3500 A3	

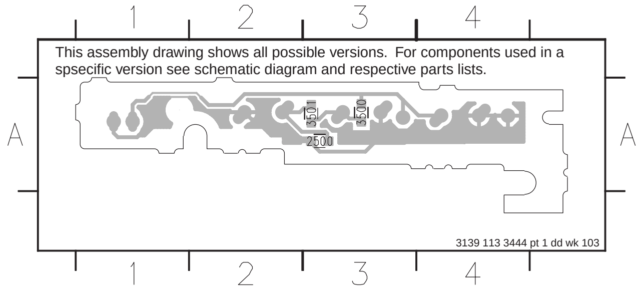

1
2
3
4
5
A
B
1500
1 KEYOUT2
2
GND-B
To Front Display
CDC1
CDC2
CDC3
3500 820R
3501 1K2
1501
1502
1503
100p
2500
GND-B
GND-B
GND-B
GND-B
8239_210_88900 ... 3444 pt 1 dd wk103

1500 A1 1501 A4 1502 A3 1503 A2


1
2
3
4
A
/panels/3139_113_34440_L3/8239_210_88900
1503
1502
1501
1500
3139 113 3444 pt 1 dd wk 103

This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.

2500 A3 3500 A3 3501 A3


1
2
3
4
A
2500
3139 113 3444 pt 1 dd wk 103

This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.

ELECTRICAL PARTS LIST - FRONT CONTROL BOARD

MISCELLANEOUS

1300	2422 025 14541	Flex Socket 11pin Hort.
1301	4822 276 13775	Tact Switch
1302	4822 276 13775	Tact Switch
1303	4822 276 13775	Tact Switch
1304	4822 276 13775	Tact Switch
1305	4822 276 13775	Tact Switch
1306	4822 276 13775	Tact Switch
1307	4822 276 13775	Tact Switch
1308	4822 276 13775	Tact Switch
1309	4822 276 13775	Tact Switch
1310	4822 276 13775	Tact Switch
1311	4822 276 13775	Tact Switch
1312	4822 276 13775	Tact Switch
1313	4822 276 13775	Tact Switch
1314	4822 276 13775	Tact Switch
1315	4822 276 13775	Tact Switch
1400	4822 267 10953	Flex Socket 7pin Vert.
1402	4822 276 13775	Tact Switch
1405	4822 276 13775	Tact Switch
1501	4822 276 13775	Tact Switch
1502	4822 276 13775	Tact Switch
1503	4822 276 13775	Tact Switch
1701	2422 129 16501	Rotary Encoder 12P
1800	4822 265 11183	Flex Socket 4pin Hort.
1801	4822 265 11529	Headphone Socket

CAPACITORS

2300	4822 122 31765	100pF 2% 63V
2401	2020 552 96305	4,7µF +80/-20% 10V
2402	2020 552 96305	4,7µF +80/-20% 10V
2403	2020 552 96305	4,7µF +80/-20% 10V
2500	4822 122 31765	100pF 2% 63V
2700	5322 126 11583	10nF 10% 50V
2701	5322 126 11583	10nF 10% 50V
2800	4822 126 14494	22nF 10% 25V
2801	4822 126 14494	22nF 10% 25V
2802	4822 126 14494	22nF 10% 25V

RESISTORS

3300	4822 051 30272	2k7 5% 0,062W
3301	4822 051 30151	150R 5% 0,062W
3302	4822 051 30221	220R 5% 0,062W
3303	4822 051 30271	270R 5% 0,062W
3304	4822 051 30391	390R 5% 0,062W
3305	4822 051 30561	560R 5% 0,062W
3306	4822 117 12968	820R 5% 0,62W
3307	4822 117 11817	1k2 1% 1/16W
3308	4822 117 12903	1k8 1% 0.063W
3309	4822 051 30272	2k7 5% 0,062W
3310	4822 051 30472	4k7 5% 0,062W
3311	4822 051 30103	10k 5% 0,062W
3312	4822 051 30272	2k7 5% 0,062W
3313	4822 051 30151	150R 5% 0,062W
3314	4822 051 30221	220R 5% 0,062W
3315	4822 051 30271	270R 5% 0,062W
3316	4822 051 30221	220R 5% 0,062W
3317	4822 051 30221	220R 5% 0,062W
3318	4822 051 30221	220R 5% 0,062W
3319	4822 051 30221	220R 5% 0,062W
3320	4822 051 30121	120R 5% 0,062W
3400	4822 051 30391	390R 5% 0,062W
3401	4822 051 30561	560R 5% 0,062W
3402	4822 117 12925	47k 1% 0.063W
3403	4822 117 12968	820R 5% 0,62W
3404	4822 051 30103	10k 5% 0,062W
3405	4822 051 30101	100R 5% 0,062W
3500	4822 117 12968	820R 5% 0,62W
3501	4822 117 11817	1k2 1% 1/16W
3601	4822 117 12139	22R 5% 0,062W
3602	4822 117 12139	22R 5% 0,062W
3700	4822 051 30103	10k 5% 0,062W
3701	4822 051 30103	10k 5% 0,062W
4302	4822 051 30008	0R Jumper 0603
4401	4822 051 30008	0R Jumper 0603
4402	4822 051 30008	0R Jumper 0603
4403	4822 051 30008	0R Jumper 0603
4700	4822 051 30008	0R Jumper 0603
4703	4822 051 30008	0R Jumper 0603
4704	4822 051 30008	0R Jumper 0603
4800	4822 051 30008	0R Jumper 0603
4802	4822 051 30008	0R Jumper 0603

COILS & FILTERS

5800	4822 157 10586	2,2µH 10% 0805
5801	4822 157 10586	2,2µH 10% 0805
5802	4822 157 10586	2,2µH 10% 0805

DIODES

6300	4822 130 11589	LTL-1CHAE
6301	4822 130 11589	LTL-1CHAE
6302	4822 130 11589	LTL-1CHAE
6303	4822 130 11589	LTL-1CHAE
6304	9322 153 37676	LB3333RT-E7898
6400	9322 160 65676	LTL-4221NLC-VA
6601	9322 147 33676	LNX9A8BYB0PH
6602	9322 147 33676	LNX9A8BYB0PH

TRANSISTORS & INTEGRATED CIRCUITS

7400	9322 164 67667	IR Receiver TSOP2236QJ1
7402	4822 130 60373	BC857B

Note: Only the parts mentioned in this list are normal service spare parts.

ETF6-LE TAPE MODULE

(Non-Dolby / Single Deck)

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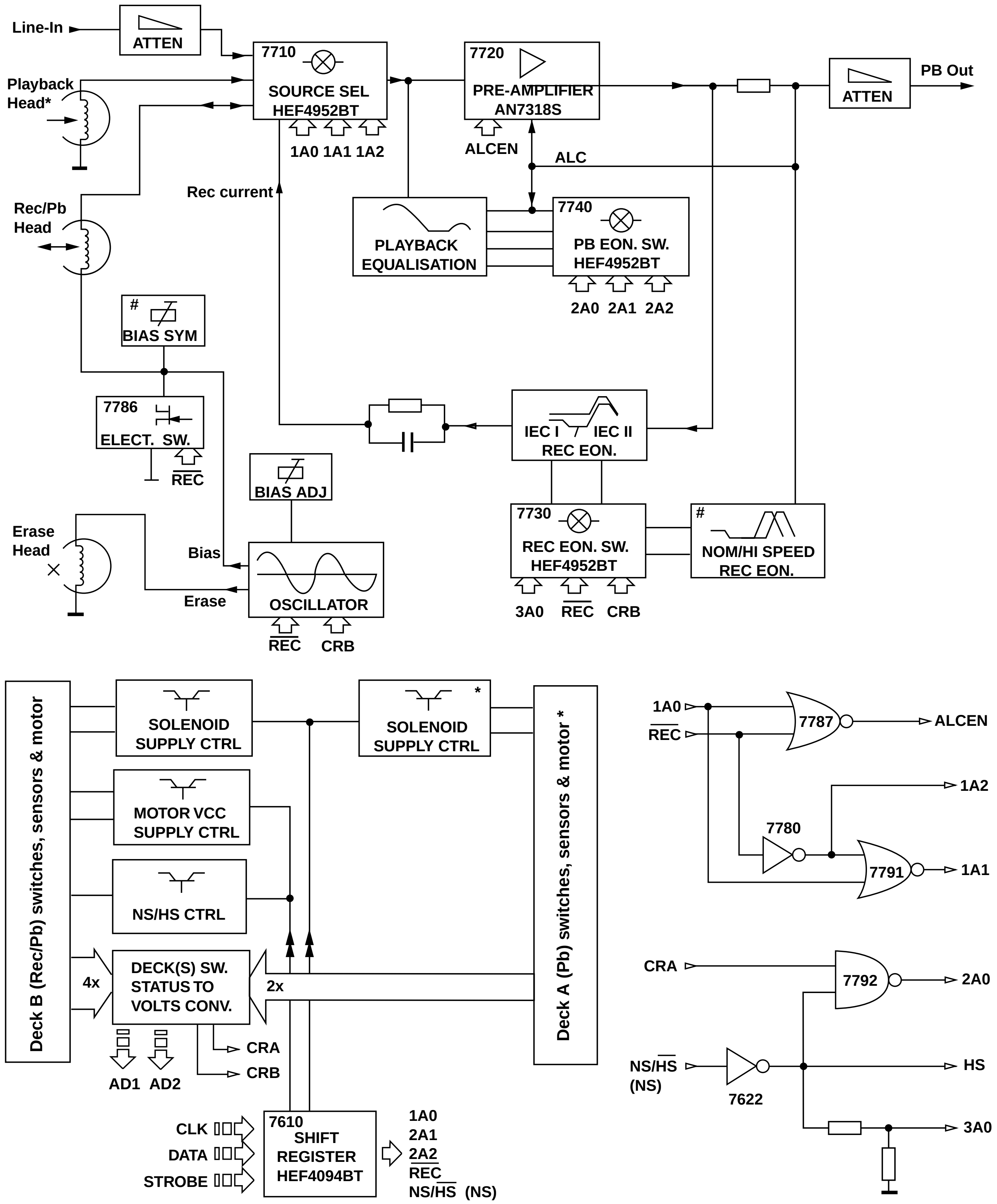
BLOCK DIAGRAM



Line-In
ATTEN
Playback Head*
7710
SOURCE SEL
HEF4952BT
1A0 1A1 1A2
7720
PRE-AMPLIFIER
AN7318S
ALCEN
ALC
ATTEN
PB Out
Rec/Pb Head
Rec current
PLAYBACK EQUALISATION
7740
PB EON. SW.
HEF4952BT
2A0 2A1 2A2
#
BIAS SYM
7786
ELECT. SW.
REC
IEC I
IEC II
REC EON.
BIAS ADJ
Erase Head
Bias
Erase
OSCILLATOR
REC CRB
7730
REC EON. SW.
HEF4952BT
3A0 REC CRB
#
NOM/HI SPEED
REC EON.
Deck B (Rec/Pb) switches, sensors & motor
SOLENOID SUPPLY CTRL
*
SOLENOID SUPPLY CTRL
MOTOR VCC SUPPLY CTRL
NS/HS CTRL
4x
DECK(S) SW. STATUS TO VOLTS CONV.
2x
Deck A (Pb) switches, sensors & motor *
CRA
CRB
AD1 AD2
CLK
DATA
STROBE
7610
SHIFT REGISTER
HEF4094BT
1A0
2A1
2A2
REC
NS/HS (NS)
1A0
REC
7787
ALCEN
1A2
7780
7791
1A1
CRA
7792
2A0
NS/HS
(NS)
7622
HS
3A0

MicroProcessor Control / Communication lines

Direct / Indirect Control lines from Shift Registers

NOTE: # For Non-dolby version only
Only 1 channel is presented.
* Not for Single deck
& Provision only

Date: wk0050

Brief introduction

General

1. Playback Mode
   Signal from the playback head (Deck B) is selected and fed through by the Mode Selector IC7710 (HEF4952BT). The signal is amplified by amplifier IC7720 (AN7318S) before feeding to the IC7740 (HEF4952BT) and out to the AF Board via connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then amplified by the amplifier IC7720 (AN7318S). The amplified output signal will pass through IC7730 (HEF4952BT) for record equalization and back to IC7710 (HEF4952BT) before registered into the Rec/PB Head (Deck B).

3. Mode Selector
   The Mode Selector IC7710 (HEF4952BT) handles 2 inputs signal, Playback Signal from Deck B and Recording Signal.

4. Amplifier PB/REC
   Amplifier IC7720 (AN7318S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

5. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

6. Muting Circuit
   Switch S4 of the IC7740 (HEF4952BT) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

7. IC7740 (HEF4952BT)
   The function of the IC7740 (HEF4952BT) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

8. IC7730 (HEF4952BT)
   The function of the IC7730 (HEF4952BT) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

9. Bias Level
   Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

10. PB Switch
    FET 7786 (J111) acting like an electronic playback switch provides a virtual ground for the Rec/PB Head (Deck B). During the Playback mode, the FET is turn on shorting pin 2 of connector 1710 to the ground. During Recording mode, the FET is turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.
11. IC7610 (HEF4094BT)
    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952BT) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_B and MOT. Recording speed is controlled via NS/HS.

ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)	ND	Non Dolby
DB	Dolby NR type B	NR	Noise Reduction
DD	Double Deck	NSD	Normal speed dubbing
DM	Double Motor	PB	Playback
FE	Ferro (IEC type I)	REC	Record
FF	Non-Autoreverse	S/A	Sub-assy
FR	Autoreverse Deck B	SD	Single Deck
Gnd x	Ground x	SM	Single Motor
HSD	High speed dubbing		

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 INTERCONNECTION TO AF BOARD

○	1	REC-L	Record input left
○	2	REC-R	Record input right
○	3	GND A	AF Ground
○	4	TAPE-L	Playback output left
○	5	+12V	D.C. supply (+12V) for AF electronics
○	6	TAPE-R	Playback output right
○	7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

CONNECTOR 1703 INTERCONNECTION TO AF BOARD

○	1	GND M	Motor Ground
○	2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706 INTERCONNECTION TO FRONT BOARD

○	1	AD2	Deck sensing switches output voltage / Deck A EOT
○	2	AD1	Deck sensing switches output voltage / Deck B EOT
○	3	+5V	DC supply +5V for ADC network
○	4	GND P	Control & Oscillator Ground
○	5	CLK	HEF4094BT shift register Clock line
○	6	DATA	HEF4094BT shift register Data line
○	7	STROBE	HEF4094BT shift register Strobe line

CONNECTOR 1710 DECK B HEADS CONNECTON

○	1	B R/P HD L+	R/P Head left channel positive
○	2	GND A	R/P Head return ground
○	3	B R/P HD R+	R/P Head right channel positive
○	4	ERASE HEAD	Erase Head
○	5	GND A	Erase Head ground

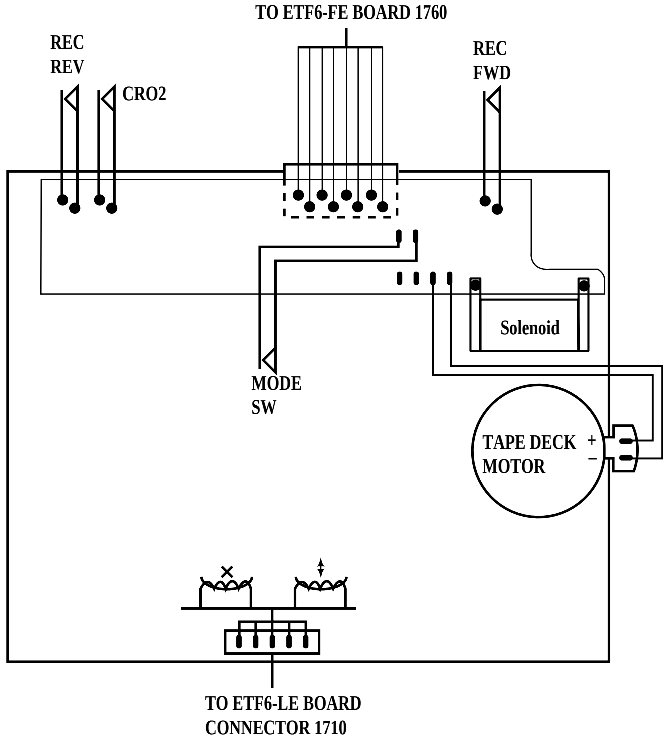
CONNECTOR 1730 DECK A HEAD CONNECTIONS ***(Not For Single deck)***

○	1	A PB HD L+	Pb Head left channel positive
○	2	GND A	Pb Head return ground shield
○	3	A PB HD R+	Pb Head right channel positive

CONNECTOR 1740 DECK A & B CONTROL INTERFACE

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply for deck B	
○	6	Vcc	Deck / Motor supply	
○	7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	

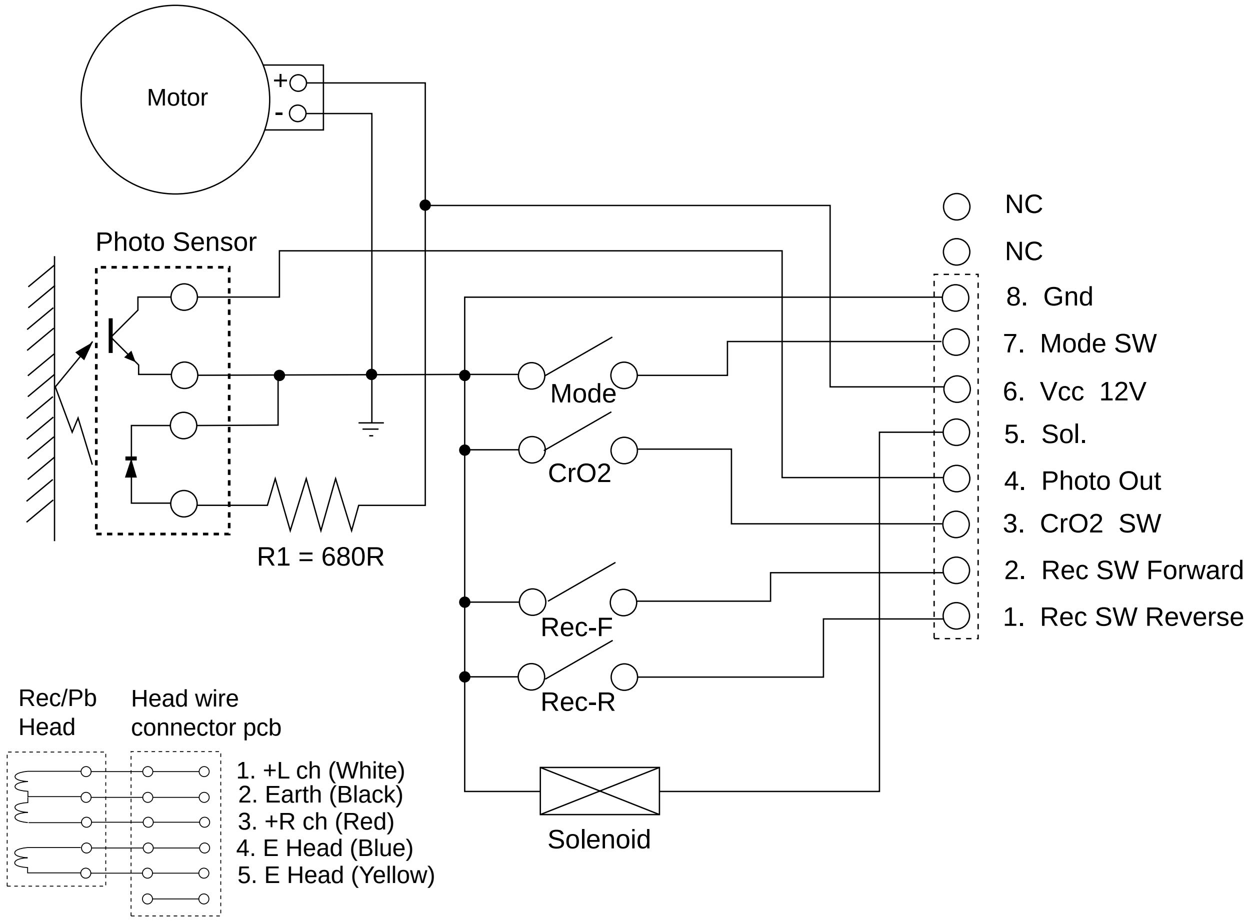
Tapedeck wiring (Single deck)


TO ETF6-FE BOARD 1760
REC
REV
CRO2
REC
FWD
Solenoid
MODE
SW
TAPE DECK
MOTOR
+
-
TO ETF6-LE BOARD
CONNECTOR 1710

Variation table for Analog Circuit

Item No.	Autoreverse (FR)	Non-Autoreverse (FF)
3723	12k	15k
3724	12k	15k
3743	1k2	1k
3744	1k2	1k
3769	12k	8k2
3772	4k7	5k6
3774	10k	8k2

TAPE MECHANISM ELECTRONICS


Motor
+
-
Photo Sensor
R1 = 680R
Mode
CrO2
Rec-F
Rec-R
Solenoid
NC
NC
8. Gnd
7. Mode SW
6. Vcc 12V
5. Sol.
4. Photo Out
3. CrO2 SW
2. Rec SW Forward
1. Rec SW Reverse
Rec/Pb
Head
Head wire
connector pcb
1. +L ch (White)
2. Earth (Black)
3. +R ch (Red)
4. E Head (Blue)
5. E Head (Yellow)

TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
MOTOR SPEED	SBC420 3150Hz	PLAY	1 or 2 LEFT RIGHT	frequency counter	check	3150Hz +/- 2%
WOW & FLUTTER	SBC420 3150Hz	PLAY		W&F-meter	check	< 0.4 % DIN
ADJUST AZIMUTH	SBC420 10kHz	PLAY FWD		mV-meter	left hand screw	max. output level & left=right
		PLAY REV ^			right hand screw	
PLAYBACK LEVEL & FREQ. RESPONSE	SBC420 315Hz	PLAY		mV-meter	check	125mV +/- 3dB (see fig.1 for freq. response)
ADJUST BIAS CURRENT	SBC419A	RECORD	5 or 6 LEFT RIGHT	mV-meter	3773	995mV
	SBC420				check	750mV +/- 1.5dB
CHECK RECORD/PLAYBACK FREQUENCY AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via 3 or 4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via 3 or 4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2 LEFT RIGHT	THD-meter	check	< 3% *

SBC419A : 4822 397 30069
SBC420 : 4822 397 30071

^ For Auto-reverse version only
* If high frequencies are not within limits, decrease bias and re-measure.
If distortion is too high, increase bias and re-meaure

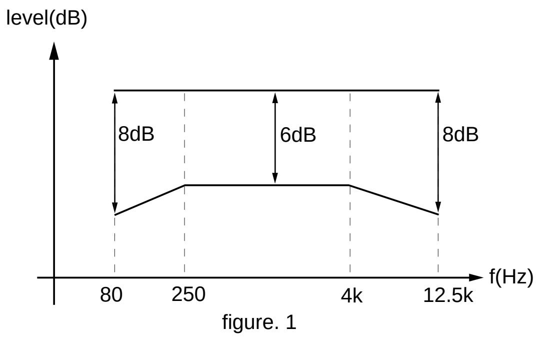


figure. 1

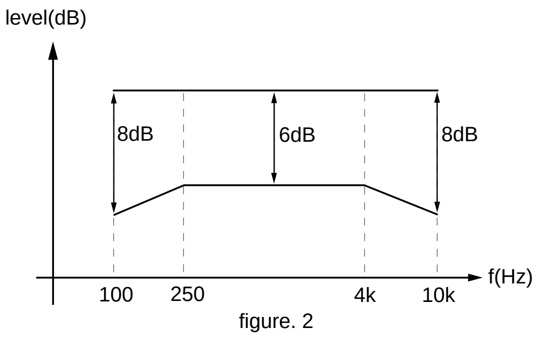
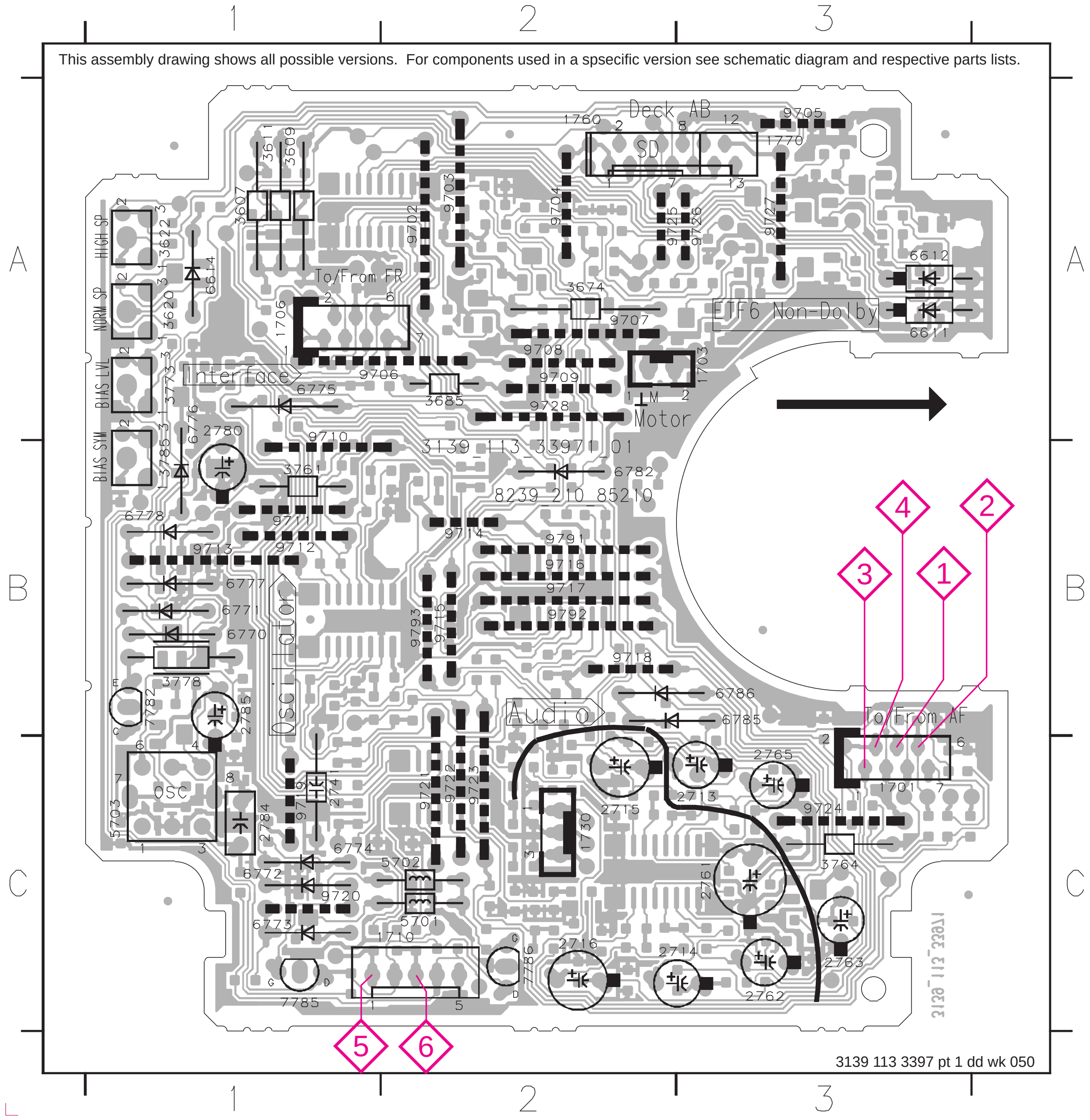


figure. 2

COMPONENT LAYOUT

1701	C3
1703	A3
1706	A1
1710	C2
1730	C2
1760	A2
1770	A3
2713	C3
2714	C3
2715	C2
2716	C2
2741	C1
2761	C3
2762	C3
2763	C3
2765	C3
2780	A1
2784	C1
2785	B1
3607	A1
3609	A1
3611	A1
3620	A1
3622	A1
3674	A2
3685	A2
3761	B1
3764	C3
3773	A1
3778	B1
3785	B1
5701	C2
5702	C2
5703	C1
6611	A3
6612	A3
6614	A1
6770	B1
6771	B1
6772	C1
6773	C1
6774	C1
6775	A1
6776	A1
6777	B1
6778	B1
6782	B2
6785	B3
6786	B3
7782	B1
7785	C1
7786	C2
9702	A2
9703	A2
9704	A2
9705	A3
9706	A1
9707	A2
9708	A2
9709	A2
9710	A1
9711	B1
9712	B1
9713	B1
9714	B2
9715	B2
9716	B2
9717	B2
9718	B2
9719	C1
9720	C1
9721	C2
9722	C2
9723	C2
9724	C3
9725	A2
9726	A3
9727	A3
9728	A2
9791	B2
9792	B2
9793	B2

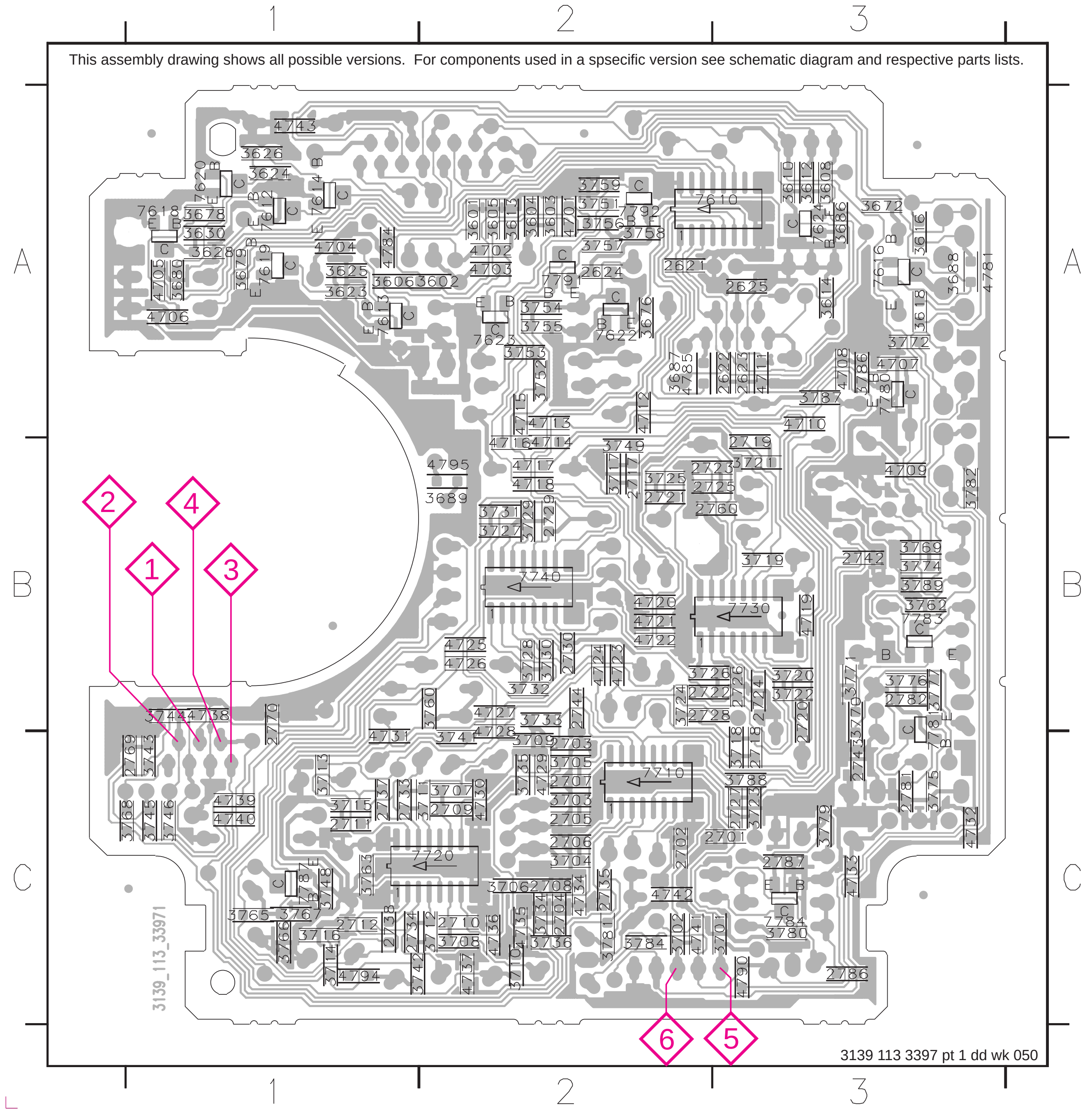


This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.

3139 113 3397 pt 1 dd wk 050

CHIP LAYOUT

2621	A2
2622	A3
2623	A3
2624	A2
2625	A3
2701	C3
2702	C2
2703	C2
2704	C2
2705	C2
2706	C2
2707	C2
2708	C2
2709	C2
2710	C2
2711	C1
2712	C1
2717	B2
2718	C3
2719	B3
2720	B3
2721	B2
2722	B2
2723	B2
2724	B3
2725	B3
2726	B3
2727	C3
2728	B2
2729	B2
2730	B2
2733	C1
2734	C1
2735	C2
2737	C1
2738	C1
2742	B3
2743	C3
2744	B2
2760	B3
2769	C1
2770	B1
2781	C3
2782	B3
2786	C3
2787	C3
3601	A2
3602	A2
3603	A2
3604	A2
3605	A2
3606	A1
3608	A3
3610	A3
3612	A3
3613	A2
3614	A3
3616	A3
3618	A3
3623	A1
3624	A1
3625	A1
3626	A1
3628	A1
3630	A1
3672	A3
3676	A2
3678	A1
3679	A1
3680	A1
3686	A3
3687	A2
3688	A3
3689	B2
3701	C3
3702	C2
3703	C2
3704	C2
3705	C2
3706	C2
3707	C2
3708	C2
3709	C2
3710	C2
3711	C2
3712	C2
3713	C1
3714	C1
3715	C1
3716	C1
3717	B2
3718	C3
3719	B3
3720	B3
3721	B3
3722	B3
3723	C3
3724	B2
3725	B2
3726	B2
3727	B2
3728	B2
3729	B2
3730	B2
3731	B2
3732	B2
3733	B2
3734	C2
3735	C2
3736	C2
3741	C2
3742	C1
3743	C1
3744	B1
3745	C1
3746	C1
3748	C1
3749	B2
3751	A2
3752	A2
3753	A2
3754	A2
3755	A2
3756	A2
3757	A2
3758	A2
3759	A2
3760	B2
3762	B3
3763	C1
3765	C1
3766	C1
3767	C1
3768	C1
3769	B3
3770	B3
3771	B3
3772	A3
3774	B3
3775	C3
3776	B3
3777	B3
3779	C3
3780	C3
3781	C2
3782	B3
3784	C2
3786	A3
3787	A3
3788	C3
3789	B3
4701	A2
4702	A2
4703	A2
4704	A1
4705	A1
4706	A1
4707	A3
4708	A3
4709	B3
4710	A3
4711	A3
4712	A2
4713	A2
4714	B2
4715	A2
4716	B2
4717	B2
4718	B2
4719	B3
4720	B2
4721	B2
4722	B2
4723	B2
4724	B2
4725	B2
4726	B2
4727	B2
4728	C2
4729	C2
4730	C2
4731	C1
4732	C3
4733	C3
4734	C2
4735	C2
4736	C2
4737	C2
4738	B1
4739	C1
4740	C1
4741	C2
4742	C2
4743	A1
4781	A3
4784	A1
4785	A2
4790	C3
4794	C1
4795	B2
7610	A3
7612	A1
7613	A1
7614	A1
7616	A3
7618	A1
7619	A1
7620	A1
7622	A2
7623	A2
7624	A3
7710	C2
7720	C2
7730	B3
7740	B2
7780	A3
7781	B3
7783	B3
7784	C3
7787	C1
7791	A2
7792	A2



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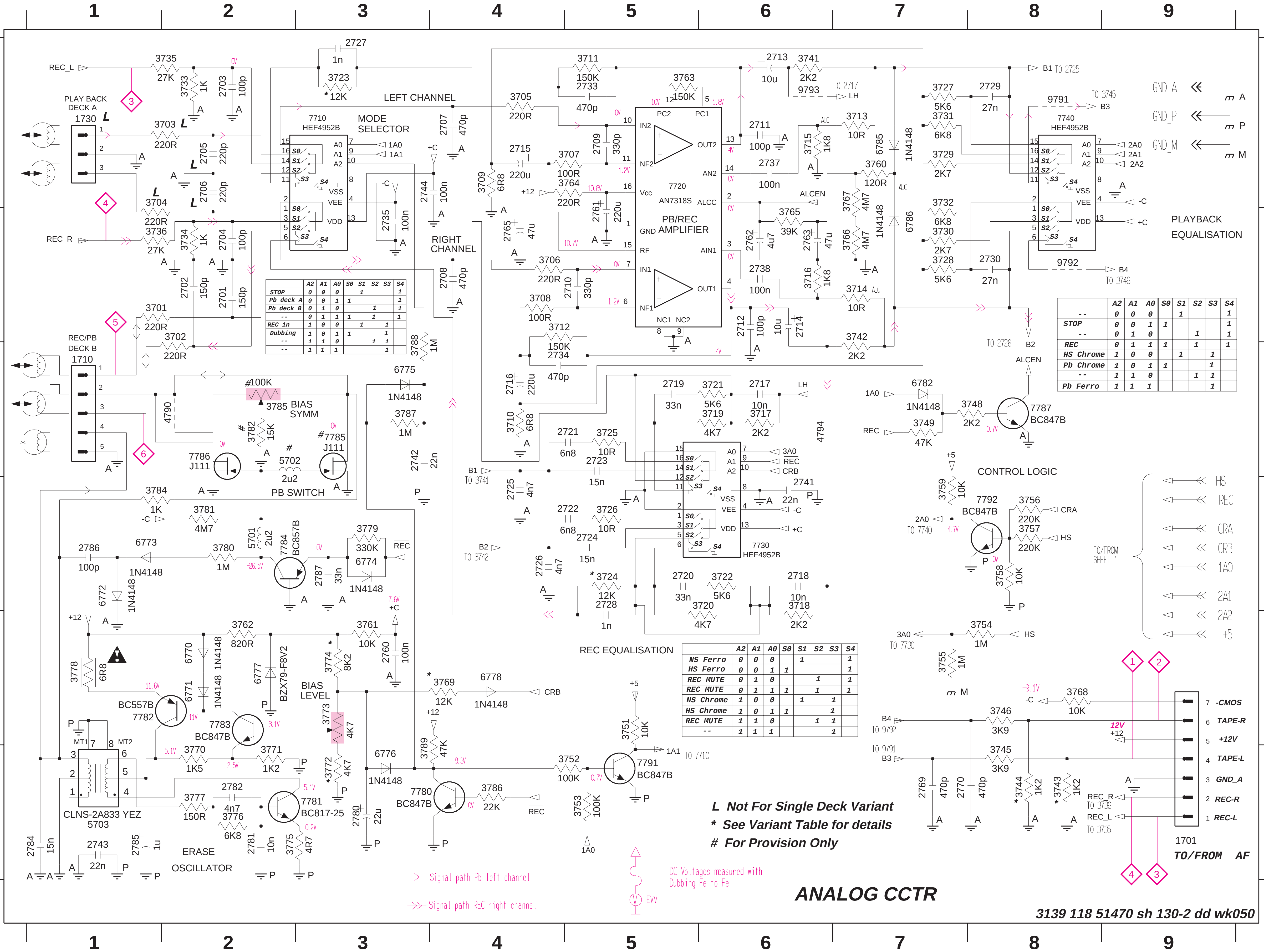
3139 113 3397 pt 1 dd wk 050

ANALOG CIRCUIT


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
REC_L
REC_R
PLAY BACK DECK A 1730
REC/PB DECK B 1710
7710 HEF4952B
MODE SELECTOR
LEFT CHANNEL
RIGHT CHANNEL
7720 AN7318S
PB/REC AMPLIFIER
IN2
OUT2
NF2
AN2
Vcc
ALCC
GND
RF
AIN1
IN1
OUT1
NF1
NC1 NC2
ALCEN
LH
7740 HEF4952B
PLAYBACK EQUALISATION
GND_A
GND_P
GND_M
TO 2725
TO 3745
TO 3746
TO 2717
TO 2726
7730 HEF4952B
REC EQUALISATION
TO 3741
TO 3742
3785 BIAS SYMM
7786 J111
7785 J111
5702 2u2
PB SWITCH
7784 BC857B
BIAS LEVEL
BZX79-F8V2
BC557B 7782
7783 BC847B
CLNS-2A833 YEZ 5703
MT1
MT2
7781 BC817-25
ERASE OSCILLATOR
7780 BC847B
7791 BC847B
TO 7710
CRB
REC
HS
CRA
7792 BC847B
7787 BC847B
CONTROL LOGIC
TO/FROM SHEET 1
TO 7740
TO 7730
TO 9792
TO 9791
REC_R TO 3736
REC_L TO 3735
1701
TO/FROM AF
7 -CMOS
6 TAPE-R
5 +12V
4 TAPE-L
3 GND_A
2 REC-R
1 REC-L
Signal path Pb left channel
Signal path REC right channel
DC Voltages measured with Dubbing Fe to Fe
EVM

	A2	A1	A0	S0	S1	S2	S3	S4
STOP	0	0	0		1			1
Pb deck A	0	0	1	1				1
Pb deck B	0	1	0			1		1
--	0	1	1	1		1		1
REC in	1	0	0		1		1	
Dubbing	1	0	1	1			1	
--	1	1	0			1	1	
--	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
--	0	0	0		1			1
STOP	0	0	1	1				1
--	0	1	0			1		1
REC	0	1	1	1		1		1
HS Chrome	1	0	0		1		1	
Pb Chrome	1	0	1	1			1	
--	1	1	0			1	1	
Pb Ferro	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
NS Ferro	0	0	0		1			1
HS Ferro	0	0	1	1				1
REC MUTE	0	1	0			1		1
REC MUTE	0	1	1	1		1		1
NS Chrome	1	0	0		1		1	
HS Chrome	1	0	1	1			1	
REC MUTE	1	1	0			1	1	
--	1	1	1				1	

L Not For Single Deck Variant

**** See Variant Table for details***

# For Provision Only

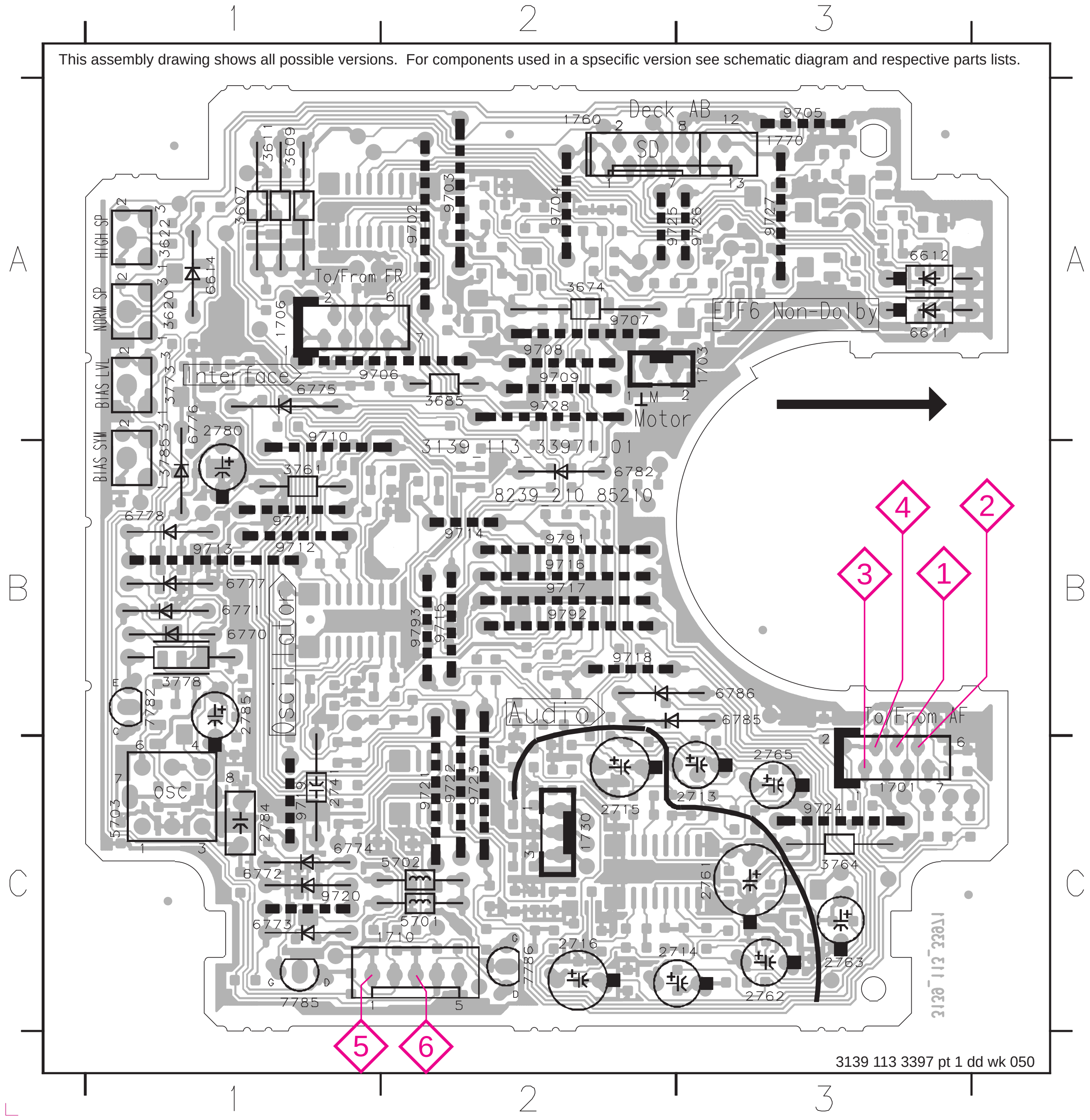
ANALOG CCTR

3139 118 51470 sh 130-2 dd wk050

1701	F9
1710	C1
1730	A1
2701	B2
2702	B2
2703	A2
2704	B2
2705	A2
2706	A2
2707	A4
2708	B4
2709	A5
2710	B5
2711	A6
2712	B6
2713	A6
2714	B6
2715	A4
2716	C4
2717	C6
2718	D6
2719	C5
2720	D5
2721	C5
2722	D5
2723	C5
2724	D5
2725	D4
2726	D4
2727	A3
2728	D5
2729	A8
2730	B8
2733	A5
2734	C4
2735	B3
2737	A6
2738	B6
2741	D6
2742	C3
2743	F1
2744	A3
2760	E3
2761	B5
2762	B6
2763	B6
2765	B4
2769	F7
2770	F7
2780	F3
2781	F2
2782	F2
2784	F1
2785	F1
2786	D1
2787	D3
3701	B1
3702	B2
3703	A2
3704	A1
3705	A4
3706	B4
3707	A5
3708	B4
3709	A4
3710	C4
3711	A5
3712	B4
3713	A7
3714	B7
3715	A6
3716	B6
3717	C6
3718	D6
3719	C6
3720	D6
3721	C6
3722	D6
3723	A3
3724	D5
3725	C5
3726	D5
3727	A7
3728	B7
3729	A7
3730	B7
3731	A7
3732	A7
3733	A2
3734	B2
3735	A2
3736	B1
3741	A6
3742	B7
3743	F8
3744	F8
3745	F8
3746	E8
3748	C8
3749	C7
3751	E5
3752	F5
3753	F5
3754	E8
3755	E7
3756	D8
3757	D8
3758	D8
3759	D7
3760	A7
3761	E3
3762	E2
3763	A5
3764	A5
3765	B6
3766	B7
3767	A7
3768	E8
3769	E4
3770	F2
3771	F2
3772	F3
3773	E3
3774	E3
3775	F2
3776	F2
3777	F2
3778	E1
3779	D3
3780	D2
3781	D2
3782	C2
3784	D1
3785	C2
3786	F4
3787	C3
3788	C3
3789	F3
4790	C2
4794	C6
5701	D2
5702	C2
5703	F1
6770	E2
6771	E2
6772	D1
6773	D1
6774	D3
6775	C3
6776	F3
6777	E2
6778	E4
6782	C7
6785	A7
6786	B7
7710	A3
7720	A5
7730	D6
7740	A8
7780	F4
7781	F3
7782	E1
7783	E2
7784	D2
7785	C3
7786	C2
7787	C8
7791	F5
7792	D8
9791	A8
9792	B8
9793	A6

COMPONENT LAYOUT

1701	C3	2716	C2	3609	A1	3785	B1	6773	C1	7785	C1	9710	A1	9720	C1	9792	B2
1703	A3	2741	C1	3611	A1	5701	C2	6774	C1	7786	C2	9711	B1	9721	C2	9793	B2
1706	A1	2761	C3	3620	A1	5702	C2	6775	A1	9702	A2	9712	B1	9722	C2		
1710	C2	2762	C3	3622	A1	5703	C1	6776	A1	9703	A2	9713	B1	9723	C2		
1730	C2	2763	C3	3674	A2	6611	A3	6777	B1	9704	A2	9714	B2	9724	C3		
1760	A2	2765	C3	3685	A2	6612	A3	6778	B1	9705	A3	9715	B2	9725	A2		
1770	A3	2780	A1	3761	B1	6614	A1	6782	B2	9706	A1	9716	B2	9726	A3		
2713	C3	2784	C1	3764	C3	6770	B1	6785	B3	9707	A2	9717	B2	9727	A3		
2714	C3	2785	B1	3773	A1	6771	B1	6786	B3	9708	A2	9718	B2	9728	A2		
2715	C2	3607	A1	3778	B1	6772	C1	7782	B1	9709	A2	9719	C1	9791	B2		

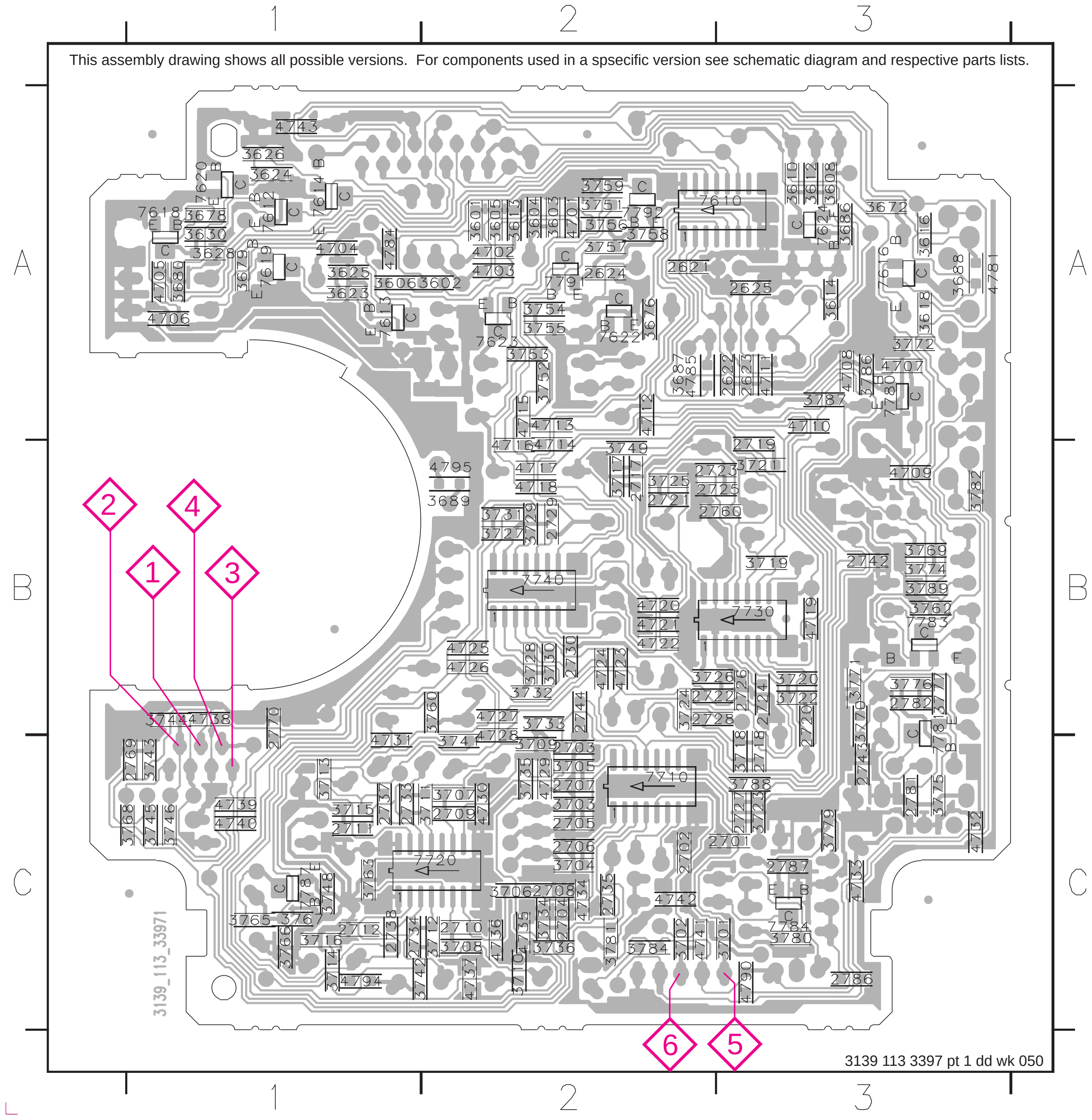


This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.

3139 113 3397 pt 1 dd wk 050

CHIP LAYOUT

2621	A2	2725	B3	3605	A2	3702	C2	3727	B2	3758	A2	3789	B3	4725	B2	7610	A3
2622	A3	2726	B3	3606	A1	3703	C2	3728	B2	3759	A2	4701	A2	4726	B2	7612	A1
2623	A3	2727	C3	3608	A3	3704	C2	3729	B2	3760	B2	4702	A2	4727	B2	7613	A1
2624	A2	2728	B2	3610	A3	3705	C2	3730	B2	3762	B3	4703	A2	4728	C2	7614	A1
2625	A3	2729	B2	3612	A3	3706	C2	3731	B2	3763	C1	4704	A1	4729	C2	7616	A3
2701	C3	2730	B2	3613	A2	3707	C2	3732	B2	3765	C1	4705	A1	4730	C2	7618	A1
2702	C2	2733	C1	3614	A3	3708	C2	3733	B2	3766	C1	4706	A1	4731	C1	7619	A1
2703	C2	2734	C1	3616	A3	3709	C2	3734	C2	3767	C1	4707	A3	4732	C3	7620	A1
2704	C2	2735	C2	3618	A3	3710	C2	3735	C2	3768	C1	4708	A3	4733	C3	7622	A2
2705	C2	2737	C1	3623	A1	3711	C2	3736	C2	3769	B3	4709	B3	4734	C2	7623	A2
2706	C2	2738	C1	3624	A1	3712	C2	3741	C2	3770	B3	4710	A3	4735	C2	7624	A3
2707	C2	2742	B3	3625	A1	3713	C1	3742	C1	3771	B3	4711	A3	4736	C2	7710	C2
2708	C2	2743	C3	3626	A1	3714	C1	3743	C1	3772	A3	4712	A2	4737	C2	7720	C2
2709	C2	2744	B2	3628	A1	3715	C1	3744	B1	3774	B3	4713	A2	4738	B1	7730	B3
2710	C2	2760	B3	3630	A1	3716	C1	3745	C1	3775	C3	4714	B2	4739	C1	7740	B2
2711	C1	2769	C1	3672	A3	3717	B2	3746	C1	3776	B3	4715	A2	4740	C1	7780	A3
2712	C1	2770	B1	3676	A2	3718	C3	3748	C1	3777	B3	4716	B2	4741	C2	7781	B3
2717	B2	2781	C3	3678	A1	3719	B3	3749	B2	3779	C3	4717	B2	4742	C2	7783	B3
2718	C3	2782	B3	3679	A1	3720	B3	3751	A2	3780	C3	4718	B2	4743	A1	7784	C3
2719	B3	2786	C3	3680	A1	3721	B3	3752	A2	3781	C2	4719	B3	4781	A3	7787	C1
2720	B3	2787	C3	3686	A3	3722	B3	3753	A2	3782	B3	4720	B2	4784	A1	7791	A2
2721	B2	3601	A2	3687	A2	3723	C3	3754	A2	3784	C2	4721	B2	4785	A2	7792	A2
2722	B2	3602	A2	3688	A3	3724	B2	3755	A2	3786	A3	4722	B2	4790	C3		
2723	B2	3603	A2	3689	B2	3725	B2	3756	A2	3787	A3	4723	B2	4794	C1		
2724	B3	3604	A2	3701	C3	3726	B2	3757	A2	3788	C3	4724	B2	4795	B2		

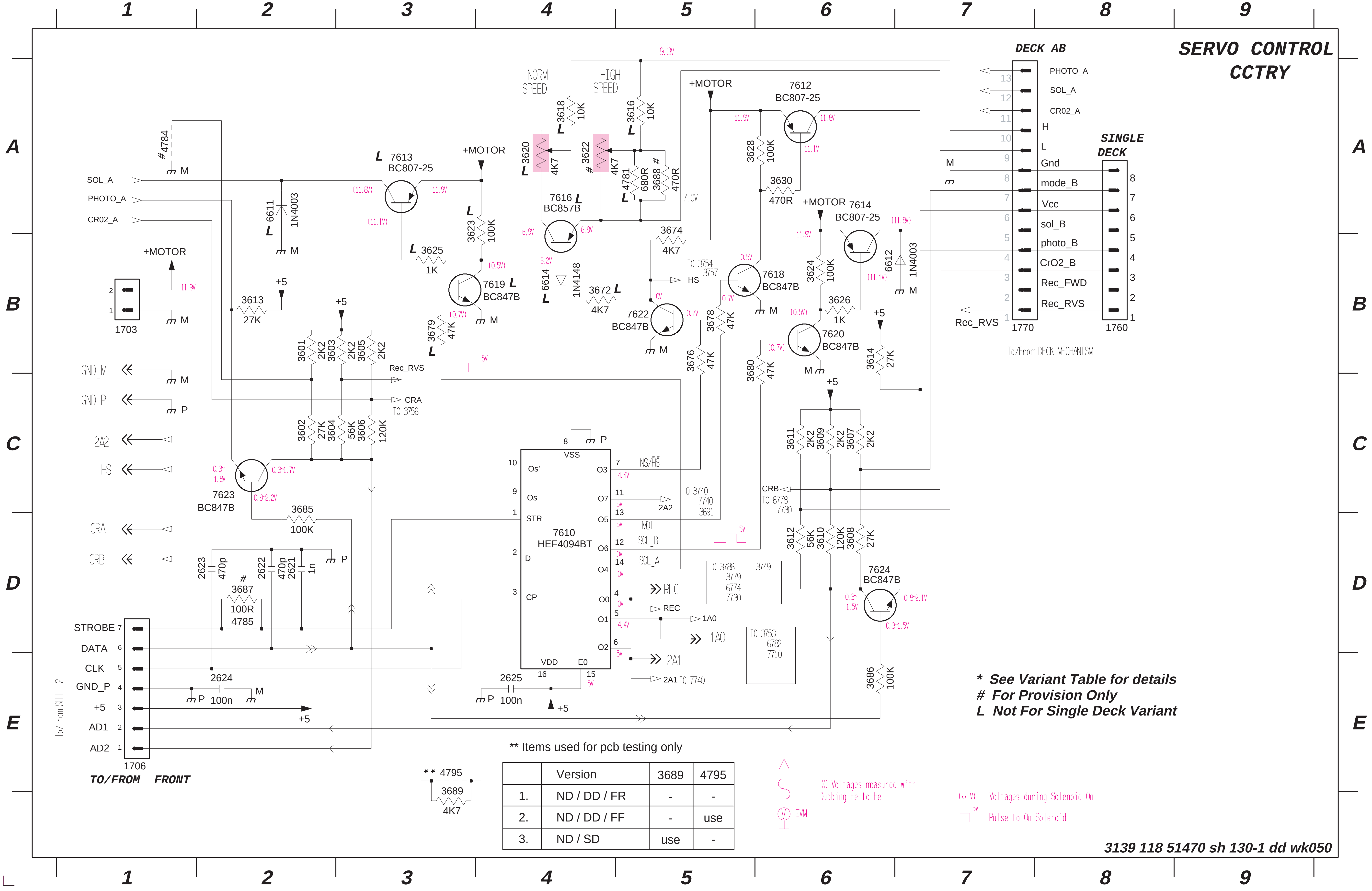


This assembly drawing shows all possible versions. For components used in a spsecific version see schematic diagram and respective parts lists.

3139 113 3397 pt 1 dd wk 050

SERVO CONTROL CIRCUIT

1703 B1	1770 B7	2623 D2	3601 B2	3604 C2	3607 C6	3610 D6	3613 B2	3618 A4	3623 A3	3626 B6	3672 B4	3678 B5	3685 C2	3688 A5	4784 A1	6611 A2	7610 D4	7614 A6	7619 B4	7623 C2
1706 E1	2621 D2	2624 E2	3602 C2	3605 B3	3608 D6	3611 C6	3614 B6	3620 A4	3624 B6	3628 A5	3674 A5	3679 B3	3686 E6	3689 E3	4785 D2	6612 B6	7612 A6	7616 A4	7620 B6	7624 D6
1760 B8	2622 D2	2625 E4	3603 B2	3606 C3	3609 C6	3612 D6	3616 A5	3622 A4	3625 B3	3630 A6	3676 B5	3680 B5	3687 D2	4781 A5	4795 E3	6614 B4	7613 A3	7618 B6	7622 B5	


1 2 3 4 5 6 7 8 9
A B C D E
SERVO CONTROL CCTRY
DECK AB
SINGLE DECK
PHOTO_A
SOL_A
CR02_A
H
L
Gnd
mode_B
Vcc
sol_B
photo_B
CrO2_B
Rec_FWD
Rec_RVS
1770
1760
To/From DECK MECHANISM
9.3V
NORM SPEED
HIGH SPEED
+MOTOR
7612 BC807-25
7613 BC807-25
7614 BC807-25
7616 BC857B
7618 BC847B
7619 BC847B
7620 BC847B
7622 BC847B
7623 BC847B
7624 BC847B
7610 HEF4094BT
3618 10K
3616 10K
3620 4K7
3622 4K7
4781 680R
3688 470R
3628 100K
3630 470R
3623 100K
3625 1K
3674 4K7
3672 4K7
3624 100K
3626 1K
3614 27K
3613 27K
3679 47K
3676 47K
3678 47K
3680 47K
3601 2K2
3603 2K2
3605 2K2
3602 27K
3604 56K
3606 120K
3685 100K
3687 100R
4785
2623 470p
2622 470p
2621 1n
2624 100n
2625 100n
3611 2K2
3609 2K2
3607 2K2
3612 56K
3610 120K
3608 27K
3686 100K
6611 1N4003
6612 1N4003
6614 1N4148
4784
1703
SOL_A
PHOTO_A
CR02_A
GND_M
GND_P
2A2
HS
CRA
CRB
Rec_RVS
CRA
TO 3756
TO 3754 3757
NS/HS
TO 3740 7740 3691
MOT
SOL_B
SOL_A
REC
1A0
2A1
TO 3786 3749 3779 6774 7730
TO 3753 6782 7710
2A1 TO 7740
CRB TO 6778 7730
Os' Os STR D CP VSS VDD EO
O3 O7 O5 O6 O4 O0 O1 O2
STROBE
DATA
CLK
GND_P
+5
AD1
AD2
1706
TO/FROM FRONT
To/From SHEET 2
M
P
** 4795
3689 4K7
DC Voltages measured with Dubbing Fe to Fe
EVM
(xx V) Voltages during Solenoid On
5V Pulse to On Solenoid

** Items used for pcb testing only

	Version	3689	4795
1.	ND / DD / FR	-	-
2.	ND / DD / FF	-	use
3.	ND / SD	use	-

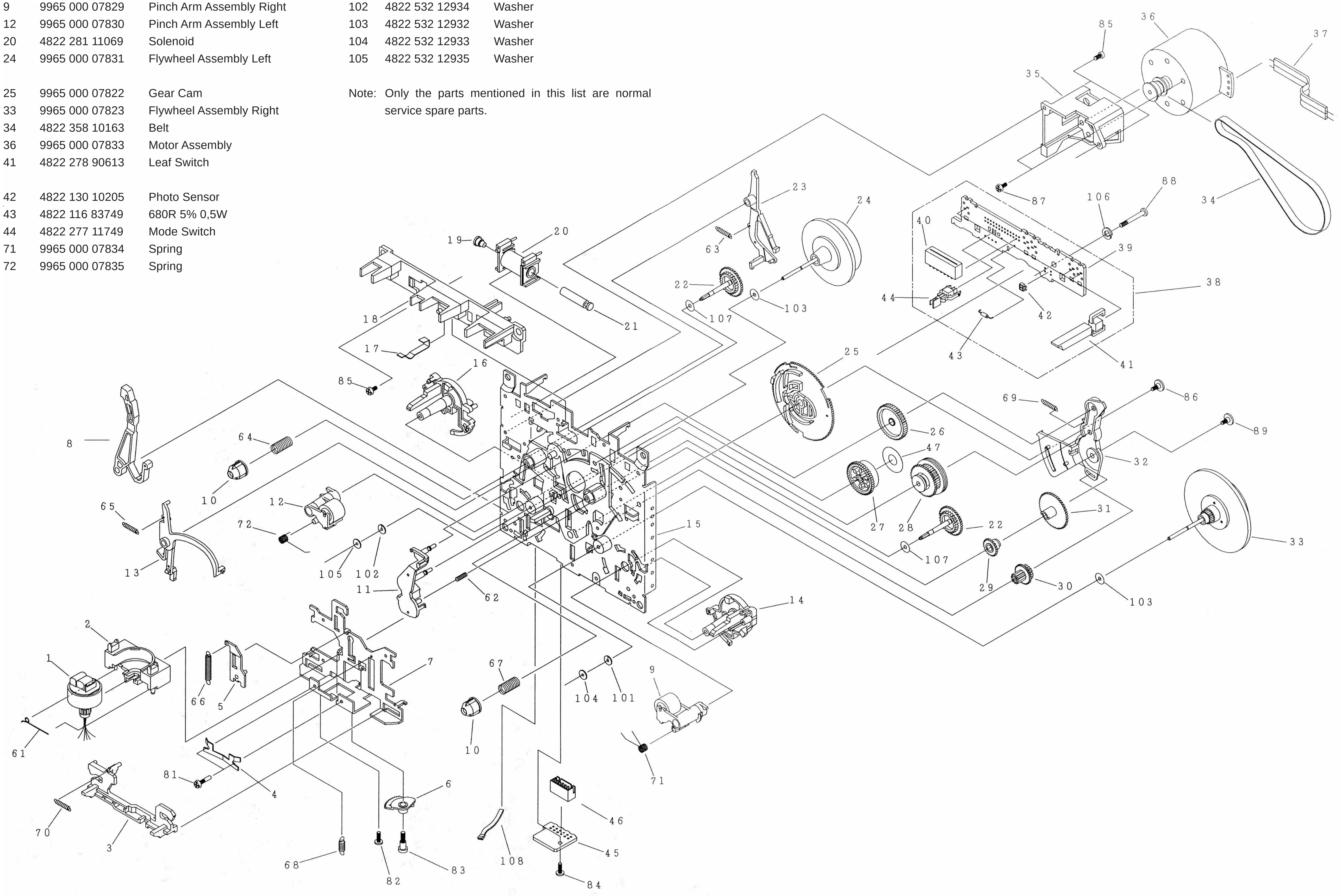
***** See Variant Table for details**
# For Provision Only
L Not For Single Deck Variant

3139 118 51470 sh 130-1 dd wk050

TAPE MECHANISM

1	9965 000 07828	Rec/Pb Head Assembly
9	9965 000 07829	Pinch Arm Assembly Right
12	9965 000 07830	Pinch Arm Assembly Left
20	4822 281 11069	Solenoid
24	9965 000 07831	Flywheel Assembly Left
25	9965 000 07822	Gear Cam
33	9965 000 07823	Flywheel Assembly Right
34	4822 358 10163	Belt
36	9965 000 07833	Motor Assembly
41	4822 278 90613	Leaf Switch
42	4822 130 10205	Photo Sensor
43	4822 116 83749	680R 5% 0,5W
44	4822 277 11749	Mode Switch
71	9965 000 07834	Spring
72	9965 000 07835	Spring
101	4822 532 12931	Washer
102	4822 532 12934	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
105	4822 532 12935	Washer

Note: Only the parts mentioned in this list are normal service spare parts.


85
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12
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72
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28
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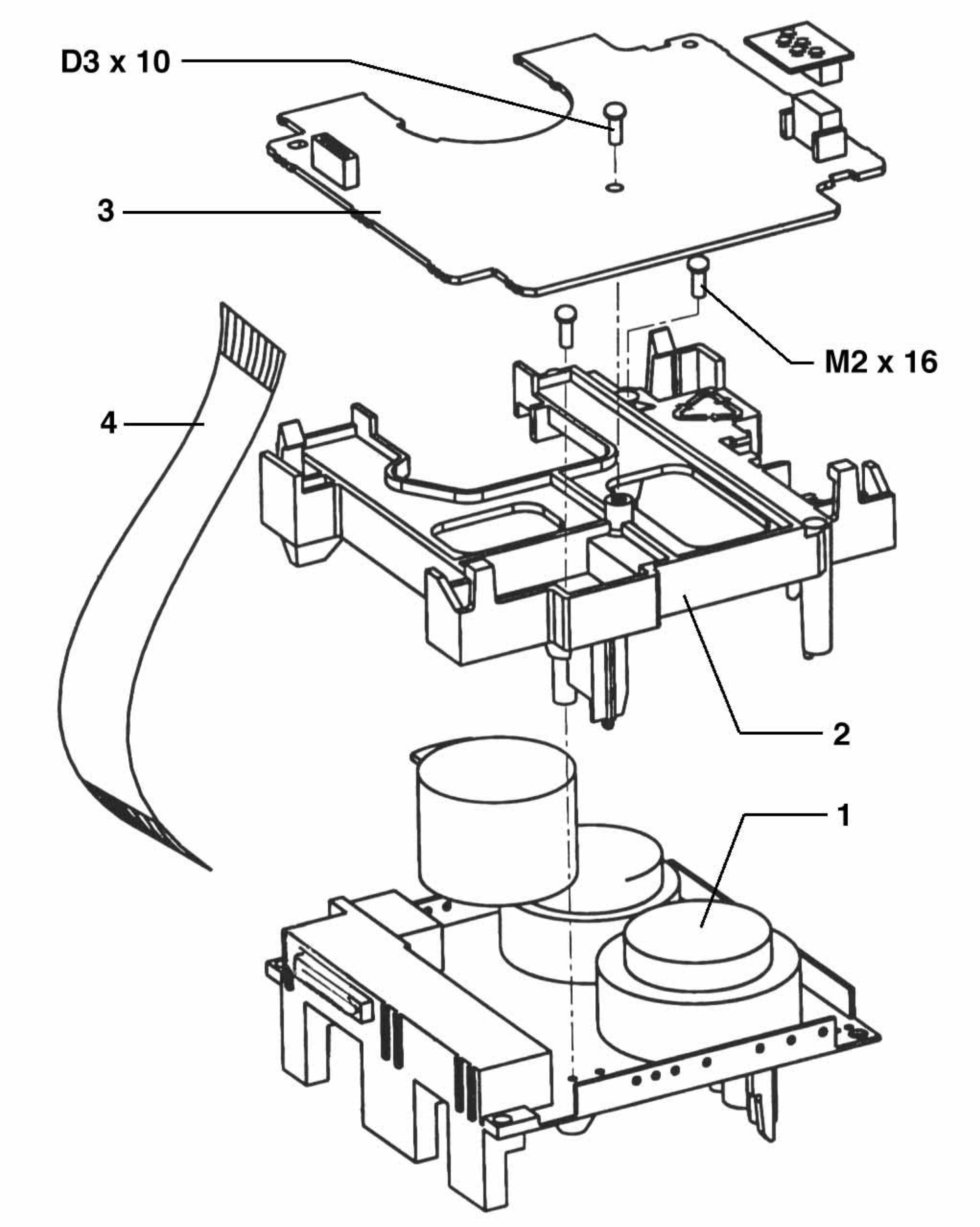
15
33
105
102
11
62
107
29
30
103
13
14
2
7
1
67
9
66
5
104
101
61
10
81
4
6
71
46
70
3
45
68
82
83
108
84

EXPLODED VIEW - TAPE MODULE



1	3139 118 77920	Tape Mechanism CRH4434
4	4822 320 12605	Flex Cable 8P 7,5cm

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS LIST - ETF6 BOARD

MISCELLANEOUS

1701	4822 267 10953	Flex Socket 7pin Vert.
1706	4822 267 10953	Flex Socket 7pin Vert.
1760	4822 265 11515	Flex Socket 8pin Vert.

CAPACITORS

2621	5322 122 31647	1nF 10% 63V
2622	5322 122 34099	470pF 10% 63V
2623	5322 122 34099	470pF 10% 63V
2624	4822 126 14585	100nF 10% 50V
2625	4822 126 14585	100nF 10% 50V
2701	5322 122 33538	150pF 2% 63V
2702	5322 122 33538	150pF 2% 63V
2703	5322 122 32531	100pF 5% 50V
2704	5322 122 32531	100pF 5% 50V
2707	5322 122 34099	470pF 10% 63V
2708	5322 122 34099	470pF 10% 63V
2709	5322 122 31863	330pF 5% 63V
2710	5322 122 31863	330pF 5% 63V
2711	5322 122 32531	100pF 5% 50V
2712	5322 122 32531	100pF 5% 50V
2713	4822 124 40248	10µF 20% 63V
2714	4822 124 40248	10µF 20% 63V
2715	4822 124 40196	220µF 20% 16V
2716	4822 124 40196	220µF 20% 16V
2717	4822 122 33177	10nF 20% 50V
2718	4822 122 33177	10nF 20% 50V
2719	4822 126 12105	33nF 5% 50V
2720	4822 126 12105	33nF 5% 50V
2721	5322 122 31866	6,8nF 10% 63V
2722	5322 122 31866	6,8nF 10% 63V
2723	4822 126 13188	15nF 5% 63V
2724	4822 126 13188	15nF 5% 63V
2725	5322 126 10223	4,7nF 10% 63V
2726	5322 126 10223	4,7nF 10% 63V
2727	5322 122 31647	1nF 10% 63V
2728	5322 122 31647	1nF 10% 63V
2729	4822 122 33735	27nF 10% 63V
2730	4822 122 33735	27nF 10% 63V
2733	5322 122 34099	470pF 10% 63V
2734	5322 122 34099	470pF 10% 63V
2735	4822 126 14585	100nF 10% 50V
2737	4822 126 14585	100nF 10% 50V
2738	4822 126 14585	100nF 10% 50V
2741	4822 126 11585	22nF +80/-20% 25V
2742	5322 122 32654	22nF 10% 63V
2743	5322 122 32654	22nF 10% 63V
2744	4822 126 14585	100nF 10% 50V
2760	4822 126 14585	100nF 10% 50V
2761	4822 124 80144	220µF 20% 25V
2762	4822 124 40769	4,7µF 20% 100V
2763	4822 124 40433	47µF 20% 25V
2765	4822 124 40433	47µF 20% 25V
2769	5322 122 34099	470pF 10% 63V
2770	5322 122 34099	470pF 10% 63V
2780	4822 124 81151	22µF 20% 50V
2781	4822 122 33177	10nF 20% 50V
2782	5322 126 10223	4,7nF 10% 63V
2784	4822 121 51305	15nF 10% 50V
2785	4822 124 21913	1µF 20% 63V
2786	5322 122 32531	100pF 5% 50V
2787	4822 126 12105	33nF 5% 50V

RESISTORS

3601	4822 117 11449	2k2 5% 0,1W
3602	4822 051 20273	27k 5% 0,1W
3603	4822 117 11449	2k2 5% 0,1W
3604	4822 117 11148	56k 1% 0,1W
3605	4822 117 11449	2k2 5% 0,1W
3606	4822 051 20124	120k 5% 0,1W
3607	4822 116 52256	2k2 5% 0,5W
3608	4822 051 20273	27k 5% 0,1W
3609	4822 116 52256	2k2 5% 0,5W
3610	4822 051 20124	120k 5% 0,1W
3611	4822 116 52256	2k2 5% 0,5W
3612	4822 117 11148	56k 1% 0,1W
3613	4822 051 20273	27k 5% 0,1W
3614	4822 051 20273	27k 5% 0,1W
3624	4822 117 10837	100k 1% 0.1W
3626	4822 051 10102	1k 2% 0,25W
3628	4822 117 10837	100k 1% 0.1W
3630	4822 051 20471	470R 5% 0,1W
3674	4822 116 52283	4k7 5% 0,5W
3676	4822 117 10834	47k 1% 0,1W
3678	4822 117 10834	47k 1% 0,1W
3680	4822 117 10834	47k 1% 0,1W
3685	4822 116 52234	100k 5% 0,5W
3686	4822 117 10837	100k 1% 0.1W
3689	4822 051 20472	4k7 5% 0,1W
3701	4822 117 11503	220R 1% 0.1W
3702	4822 117 11503	220R 1% 0.1W
3705	4822 117 11503	220R 1% 0.1W
3706	4822 117 11503	220R 1% 0.1W
3707	4822 117 11373	100R 1% 0,1W
3708	4822 117 11373	100R 1% 0,1W
3709	4822 051 20688	6R8 5% 0,1W
3710	4822 051 20688	6R8 5% 0,1W
3711	4822 051 20154	150k 5% 0,1W
3712	4822 051 20154	150k 5% 0,1W
3713	4822 051 20109	10R 5% 0,1W
3714	4822 051 20109	10R 5% 0,1W
3715	4822 051 20182	1k8 5% 0,1W
3716	4822 051 20182	1k8 5% 0,1W
3717	4822 117 11449	2k2 5% 0,1W
3718	4822 117 11449	2k2 5% 0,1W

ELECTRICAL PARTS LIST - ETF6 BOARD

RESISTORS

3719	4822 051 20472	4k7 5% 0,1W
3720	4822 051 20472	4k7 5% 0,1W
3721	4822 051 20562	5k6 5% 0,1W
3722	4822 051 20562	5k6 5% 0,1W
3723	4822 117 11383	12k 1% 0,1W
3724	4822 117 11383	12k 1% 0,1W
3725	4822 051 20109	10R 5% 0,1W
3726	4822 051 20109	10R 5% 0,1W
3727	4822 051 20562	5k6 5% 0,1W
3728	4822 051 20562	5k6 5% 0,1W
3729	4822 117 12955	2k7 1% 0,1W
3730	4822 117 12955	2k7 1% 0,1W
3731	4822 117 11507	6k8 1% 0,1W
3732	4822 117 11507	6k8 1% 0,1W
3733	4822 051 10102	1k 2% 0,25W
3734	4822 051 10102	1k 2% 0,25W
3735	4822 051 20273	27k 5% 0,1W
3736	4822 051 20273	27k 5% 0,1W
3741	4822 117 11449	2k2 5% 0,1W
3742	4822 117 11449	2k2 5% 0,1W
3743	4822 051 20122	1k2 5% 0,1W
3744	4822 051 20122	1k2 5% 0,1W
3745	4822 051 20392	3k9 5% 0,1W
3746	4822 051 20392	3k9 5% 0,1W
3748	4822 117 11449	2k2 5% 0,1W
3749	4822 117 10834	47k 1% 0,1W
3751	4822 117 10833	10k 1% 0,1W
3752	4822 117 10837	100k 1% 0.1W
3753	4822 117 10837	100k 1% 0.1W
3754	4822 051 20105	1M 5% 0,1W
3755	4822 051 20105	1M 5% 0,1W
3756	4822 117 13579	220k 1% 0.1W
3757	4822 117 13579	220k 1% 0.1W
3758	4822 117 10833	10k 1% 0,1W
3759	4822 117 10833	10k 1% 0,1W
3760	4822 051 20121	120R 5% 0,1W
3761	4822 050 21003	10k 1% 0,6W
3762	4822 117 11454	820R 1% 0,1W
3763	4822 051 20154	150k 5% 0,1W
3764	4822 116 83872	220R 5% 0,5W
3765	4822 051 20393	39k 5% 0,1W
3766	4822 051 20475	4M7 5% 0,1W
3767	4822 051 20475	4M7 5% 0,1W
3768	4822 117 10833	10k 1% 0,1W
3769	4822 117 11383	12k 1% 0,1W
3770	4822 117 11139	1k5 1% 0,1W
3771	4822 051 20122	1k2 5% 0,1W
3772	4822 051 20472	4k7 5% 0,1W
3773	4822 100 12227	Trimmer 4k7 30% 0,1W
3774	4822 117 10833	10k 1% 0,1W
3775	4822 051 20478	4R7 5% 0,1W
3776	4822 117 11507	6k8 1% 0,1W
3777	4822 117 10353	150R 1% 0,1W
3778	4822 052 10688	⚠ 6R8 5% 0,33W
3779	4822 051 20334	330k 5% 0,1W
3780	4822 051 20105	1M 5% 0,1W
3781	4822 051 20475	4M7 5% 0,1W
3784	4822 051 10102	1k 2% 0,25W
3786	4822 051 20223	22k 5% 0,1W
3787	4822 051 20105	1M 5% 0,1W
3788	4822 051 20105	1M 5% 0,1W
3789	4822 117 10834	47k 1% 0,1W
4701	4822 051 20008	0R Jumper 0805
4702	4822 051 20008	0R Jumper 0805
4703	4822 051 20008	0R Jumper 0805
4704	4822 051 20008	0R Jumper 0805
4705	4822 051 20008	0R Jumper 0805
4706	4822 051 20008	0R Jumper 0805
4707	4822 051 20008	0R Jumper 0805
4708	4822 051 20008	0R Jumper 0805
4709	4822 051 20008	0R Jumper 0805
4710	4822 051 20008	0R Jumper 0805
4711	4822 051 20008	0R Jumper 0805
4712	4822 051 20008	0R Jumper 0805
4713	4822 051 20008	0R Jumper 0805
4714	4822 051 20008	0R Jumper 0805
4715	4822 051 20008	0R Jumper 0805
4716	4822 051 20008	0R Jumper 0805
4717	4822 051 20008	0R Jumper 0805
4718	4822 051 20008	0R Jumper 0805
4719	4822 051 20008	0R Jumper 0805
4720	4822 051 20008	0R Jumper 0805
4721	4822 051 20008	0R Jumper 0805
4722	4822 051 20008	0R Jumper 0805
4723	4822 051 20008	0R Jumper 0805
4724	4822 051 20008	0R Jumper 0805
4725	4822 051 20008	0R Jumper 0805
4726	4822 051 20008	0R Jumper 0805
4727	4822 051 20008	0R Jumper 0805
4728	4822 051 20008	0R Jumper 0805
4729	4822 051 20008	0R Jumper 0805
4730	4822 051 20008	0R Jumper 0805
4731	4822 051 20008	0R Jumper 0805
4732	4822 051 20008	0R Jumper 0805
4733	4822 051 20008	0R Jumper 0805
4734	4822 051 20008	0R Jumper 0805
4735	4822 051 20008	0R Jumper 0805
4736	4822 051 20008	0R Jumper 0805
4737	4822 051 20008	0R Jumper 0805
4738	4822 051 20008	0R Jumper 0805
4739	4822 051 20008	0R Jumper 0805
4740	4822 051 20008	0R Jumper 0805
4741	4822 051 20008	0R Jumper 0805
4742	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - ETF6 BOARD

RESISTORS

4785	4822 051 20008	0R Jumper 0805
4790	4822 051 20008	0R Jumper 0805
4794	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5701	4822 157 11477	Coil 2,2µH 5%
5703	4822 156 20946	Osc Coil 100kHz

DIODES

6612	4822 130 31878	1N4003G
6770	4822 130 30621	1N4148
6771	4822 130 30621	1N4148
6772	4822 130 30621	1N4148
6773	4822 130 30621	1N4148
6774	4822 130 30621	1N4148
6775	4822 130 30621	1N4148
6776	4822 130 30621	1N4148
6777	4822 130 34382	BZX79-B8V2
6778	4822 130 30621	1N4148
6782	4822 130 30621	1N4148
6785	4822 130 30621	1N4148
6786	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7610	5322 209 11306	HEF4094BT
7612	5322 130 60845	BC807-25
7614	5322 130 60845	BC807-25
7618	5322 130 60159	BC847B
7620	5322 130 60159	BC847B
7622	5322 130 60159	BC847B
7623	5322 130 60159	BC847B
7624	5322 130 60159	BC847B
7710	4822 209 32919	HEF4952BT
7720	4822 209 32918	AN7318S
7730	4822 209 32919	HEF4952BT
7740	4822 209 32919	HEF4952BT
7780	5322 130 60159	BC847B
7781	4822 130 42804	BC817-25
7782	4822 130 44568	BC557B
7783	5322 130 60159	BC847B
7784	4822 130 60373	BC857B
7786	4822 130 63494	J111
7787	5322 130 60159	BC847B
7791	5322 130 60159	BC847B
7792	5322 130 60159	BC847B

Note: Only the parts mentioned in this list are normal service spare parts.

3DTC Module

(Basic version)

Layout stage .4

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WARNING

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE

- ***SWITCH OFF POWER SUPPLY***
- ***ESD PROTECTION***

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CD mechanism:

1. Disconnect CD drive flexfoil from old CD drive
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Remove old CD drive
4. Remove short-circuit from flexfoil of CD drive
5. Connect flexfoil to new CD drive
6. Position new CD drive in its studs
7. Remove short-circuit from Laserunit

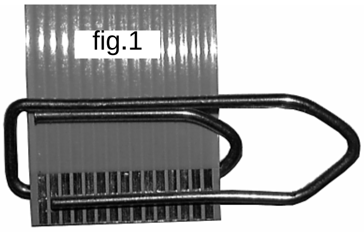
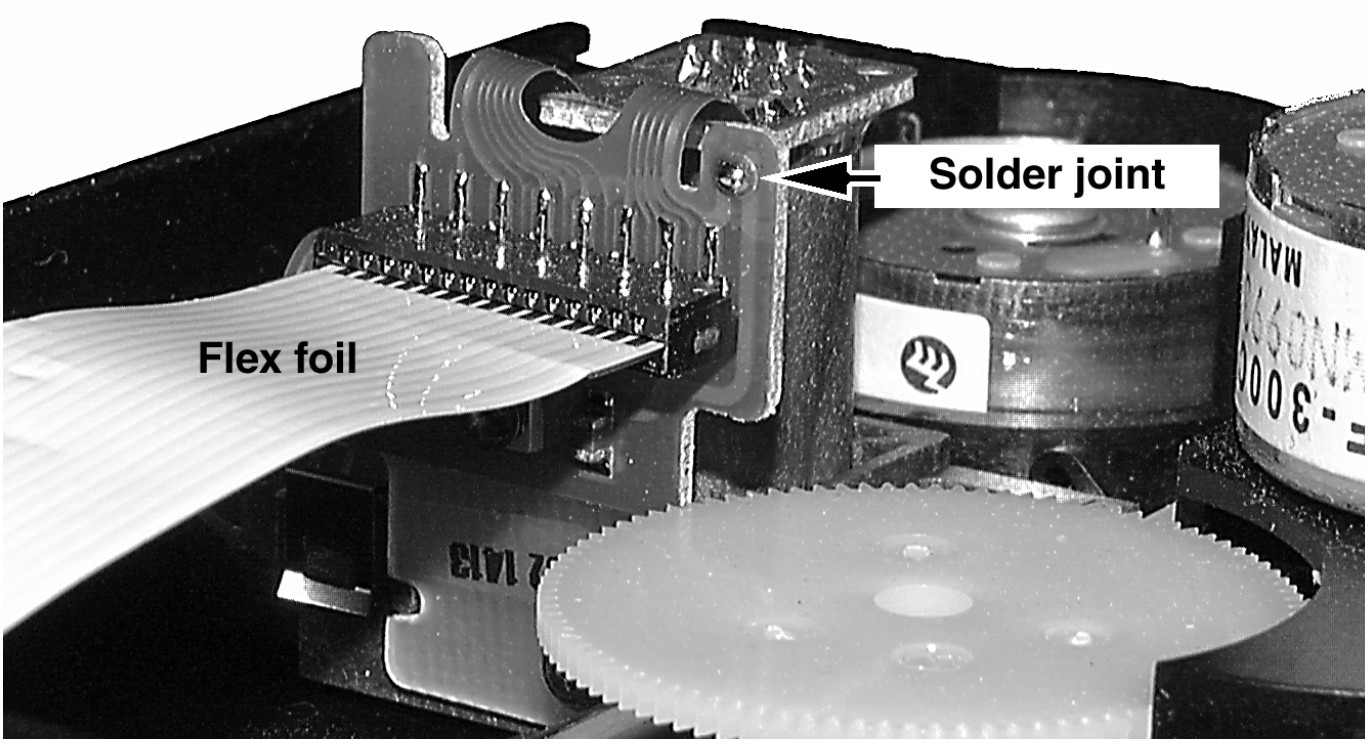


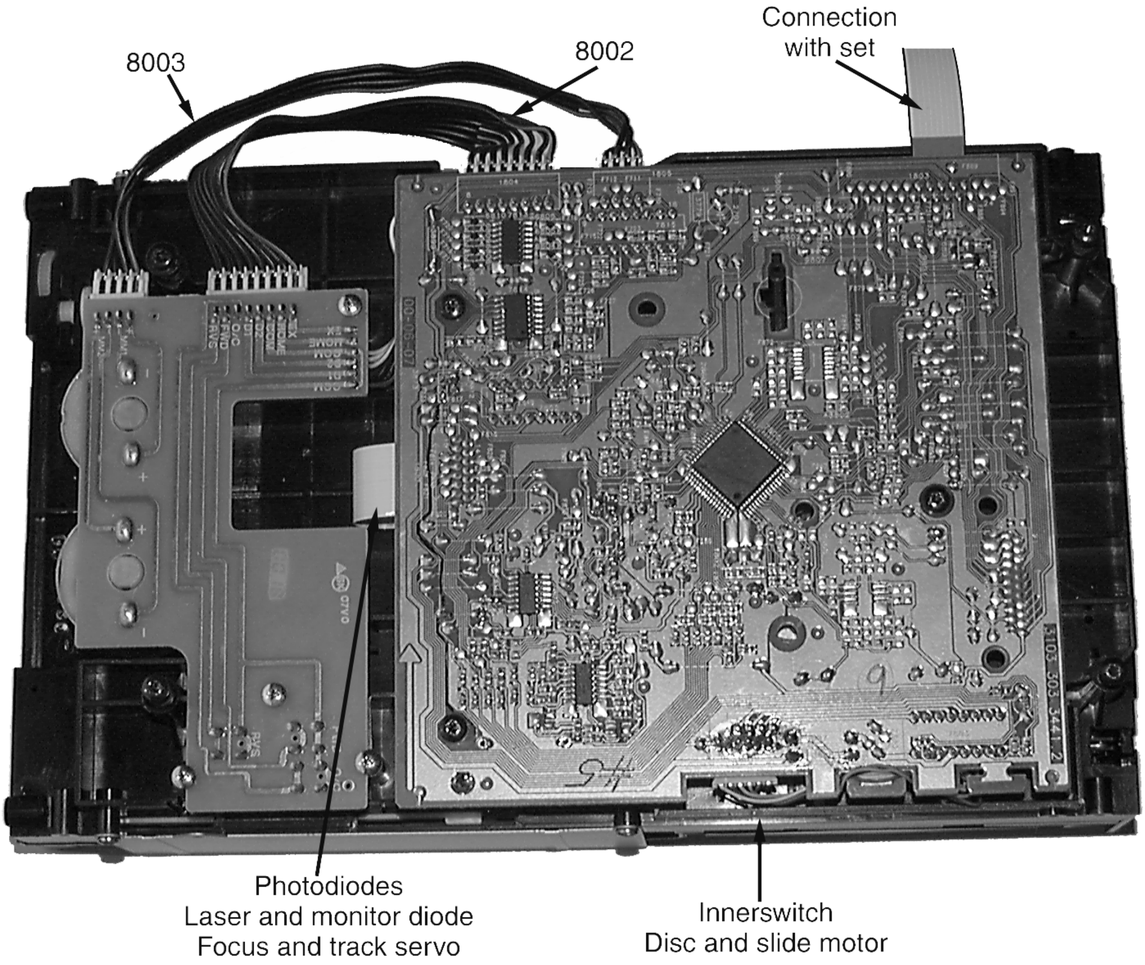
fig.1

Attention: The laser diode of this CD drive is protected against ESD by a solder joint which shortcircuits the laserdiode to ground.
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.



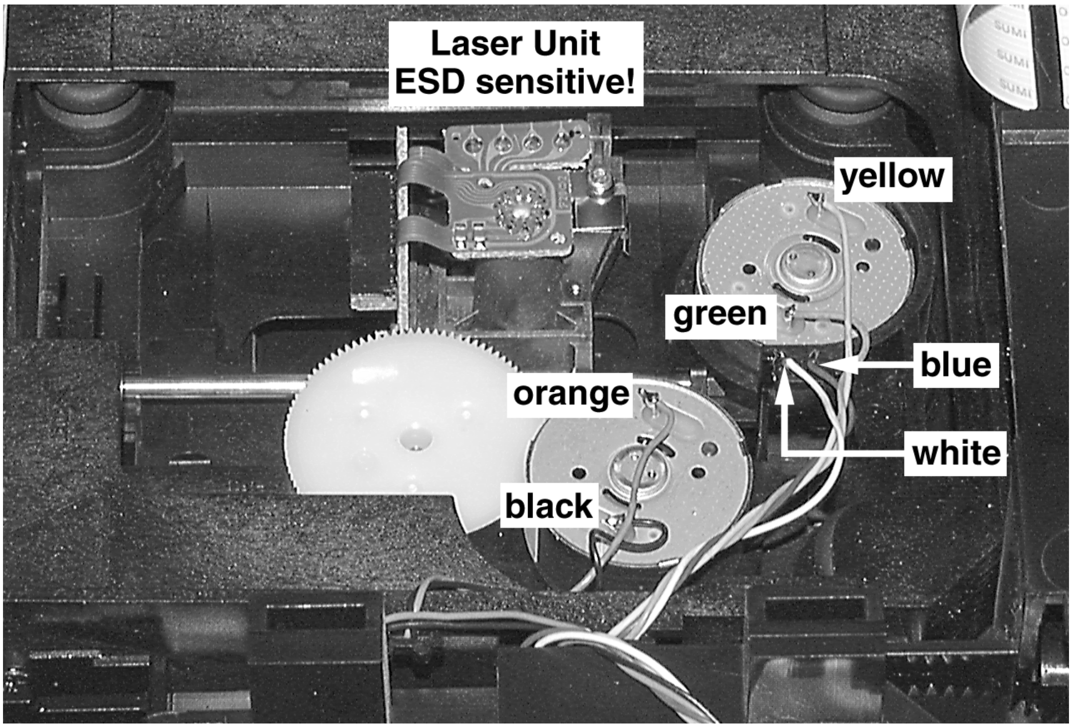
WIRING

Module


8003
8002
Connection with set
Photodiodes
Laser and monitor diode
Focus and track servo
Innerswitch
Disc and slide motor

WIRING

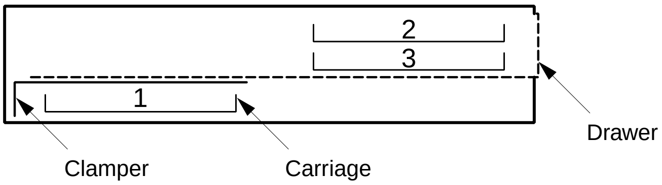
CD Drive


Laser Unit
ESD sensitive!
yellow
green
blue
orange
white
black

Brief description

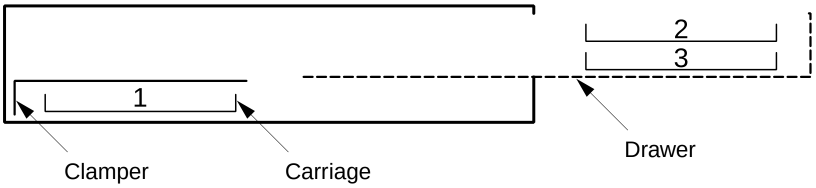
On the next pages various actions of the 3 Disc Tray Changer are described with simplified drawings.

1. Initial state. After Power on the changer is in this position.
The drawer closed
Carriage #1 is in Play position
Carriage #2 and #3 are in home position

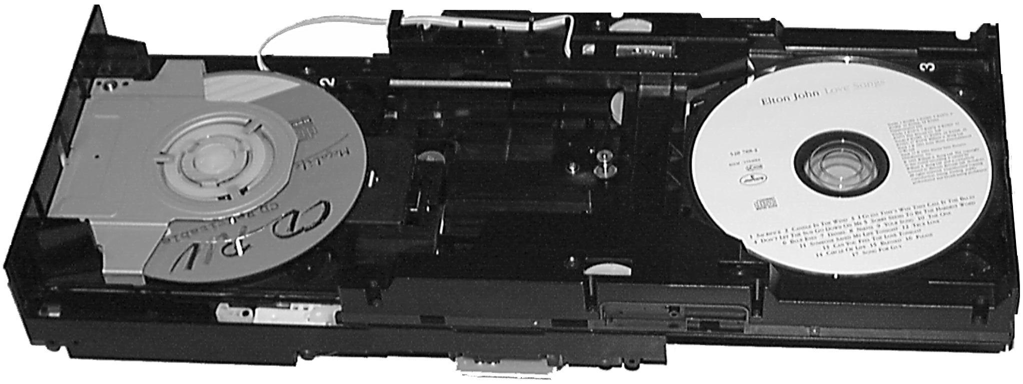

2
3
1
Drawer
Clamper
Carriage

The Changer looks like

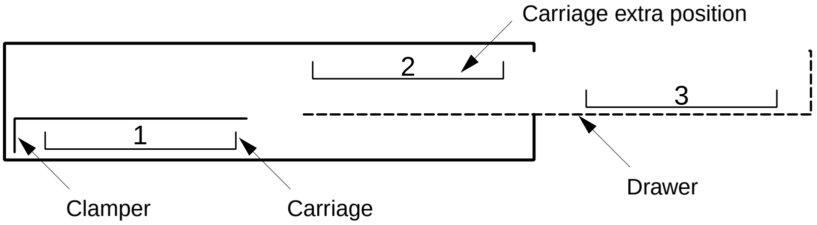
2. Tray open.
The Drawer is moved out
Carriage #2 and #3 remain in home position


2
3
1
Drawer
Clamper
Carriage

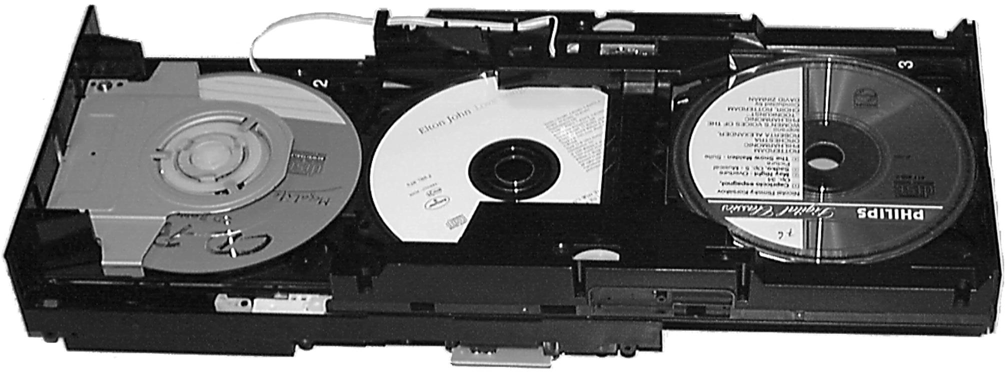
The Changer looks like



3. Carriage extra.
This position is necessary to get access to the lower carriage. It is also used during disc change.

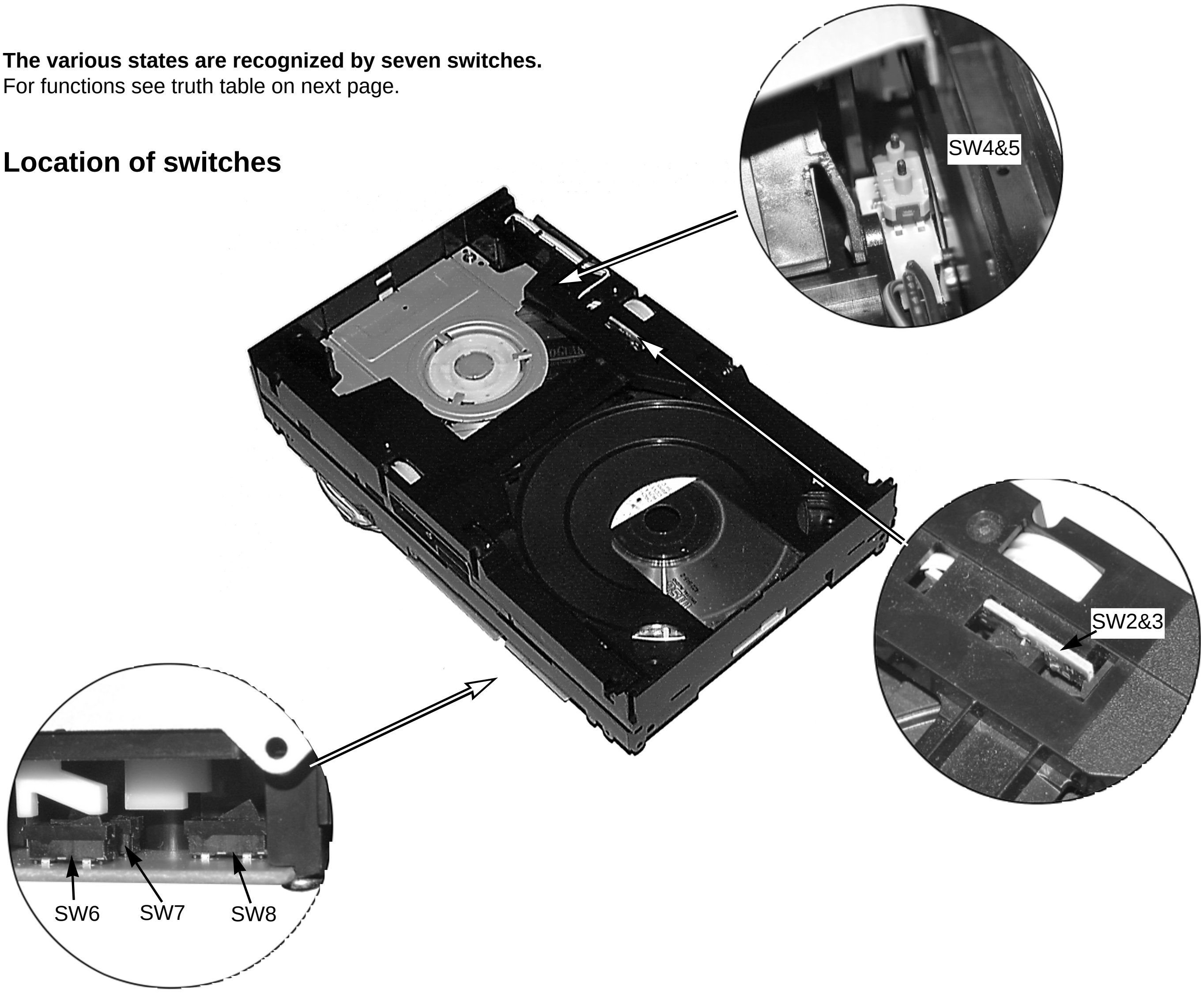

Carriage extra position
2
3
1
Clamper
Carriage
Drawer

The changer looks like



The various states are recognized by seven switches.
For functions see truth table on next page.

Location of switches

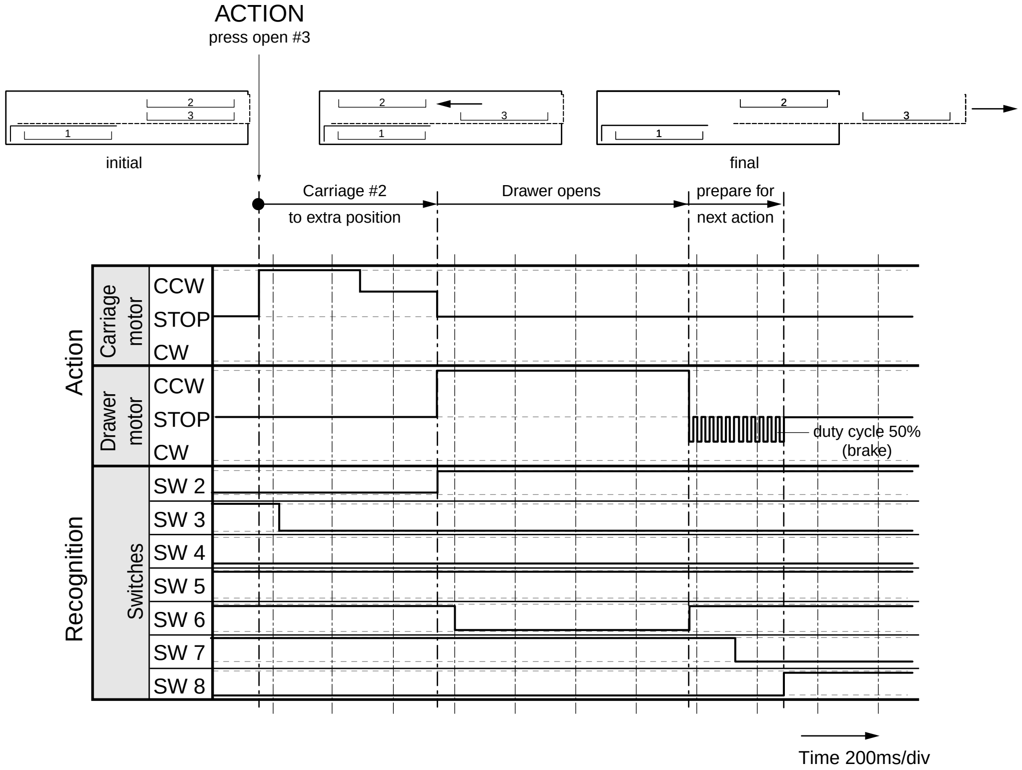

SW4&5
SW2&3
SW6
SW7
SW8

Truth Table

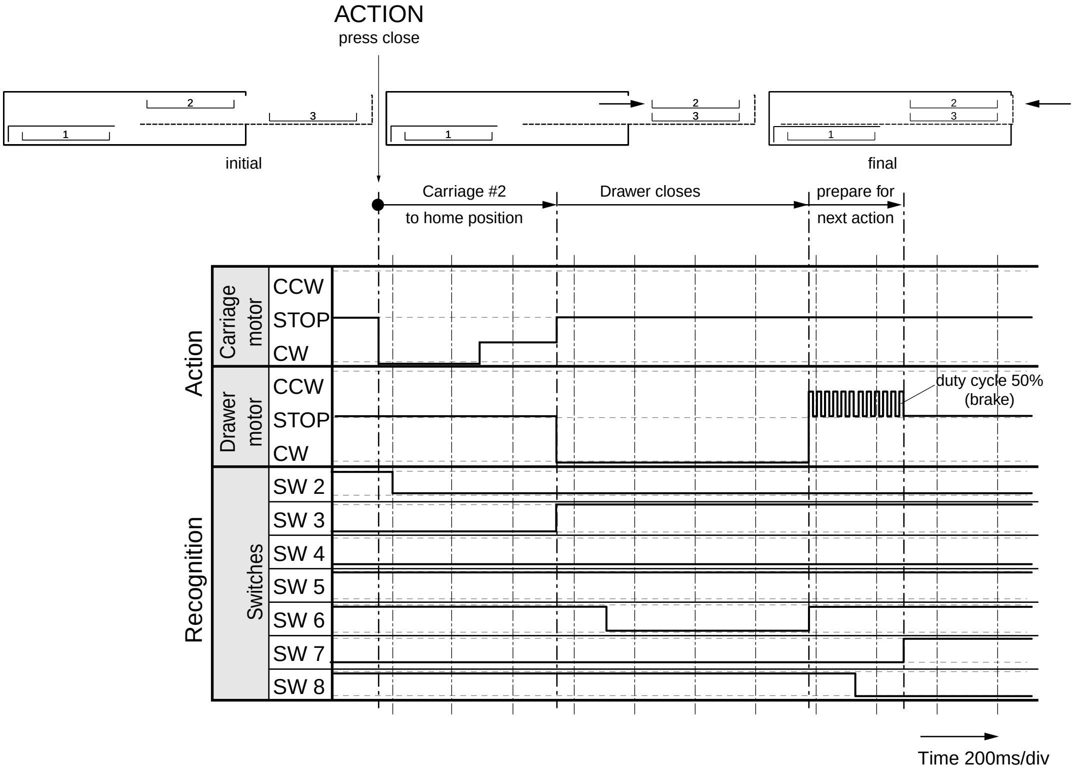
Function	Register output / Switch							
	Q0	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**
	SW 8	**SW 7**	**SW 6**	**SW 5**	**SW 4**	**SW 3**	**SW 2**	**-**
Slider reverse recognition	1	0	0	0	0	0	0	X
Slider forward recognition	0	1	0	0	0	0	0	X
Drawer closed recognition	0	0	1	0	0	0	0	X
No carriage under clamper	0	0	0	0	0	0	0	X
Carriage #1 under clamper	0	0	0	0	1	0	0	X
Carriage #2 under clamper	0	0	0	1	0	0	0	X
Carriage #3 under clamper	0	0	0	1	1	0	0	X
Carriage home recognition	0	0	0	0	0	1	0	X
Carriage extra recognition	0	0	0	0	0	0	1	X

Timing Diagrams

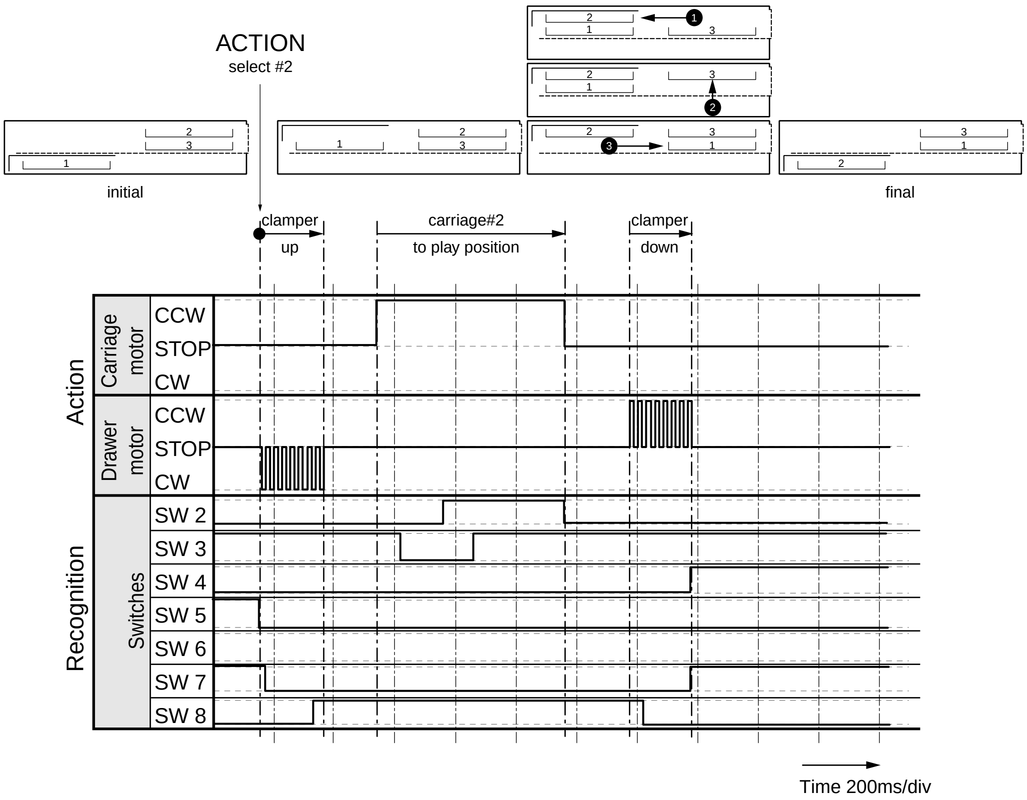
1. Open #3


ACTION
press open #3
2
3
1
initial
final
Carriage #2
to extra position
Drawer opens
prepare for
next action
Action
Carriage motor
Drawer motor
CCW
STOP
CW
CCW
STOP
CW
duty cycle 50%
(brake)
Recognition
Switches
SW 2
SW 3
SW 4
SW 5
SW 6
SW 7
SW 8
Time 200ms/div

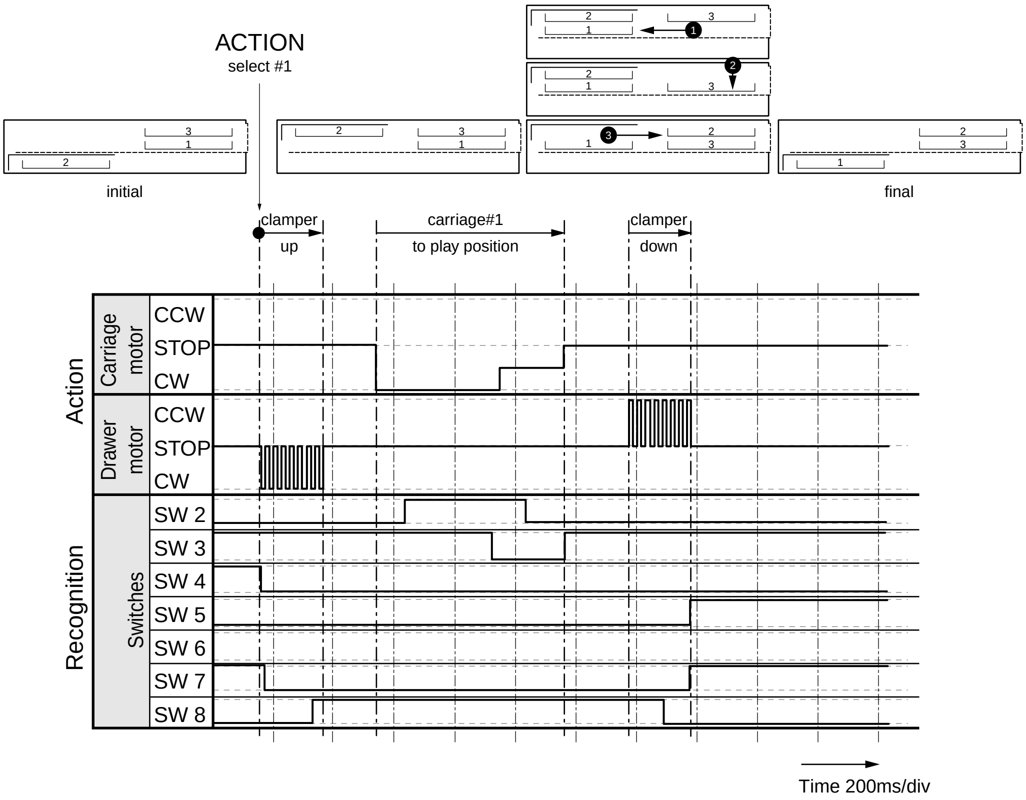
2. Close #3


ACTION
press close
2
3
1
initial
final
Carriage #2
to home position
Drawer closes
prepare for
next action
Action
Carriage motor
Drawer motor
CCW
STOP
CW
CCW
STOP
CW
duty cycle 50%
(brake)
Recognition
Switches
SW 2
SW 3
SW 4
SW 5
SW 6
SW 7
SW 8
Time 200ms/div

3. Select #2

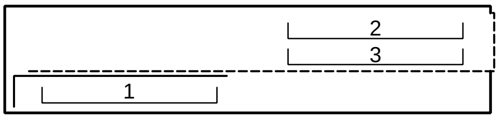

ACTION
select #2
2
3
1
initial
1
2
3
2
1
3
2
1
3
2
3
1
3
1
2
final
clamper
up
carriage#2
to play position
clamper
down
Action
Carriage motor
CCW
STOP
CW
Drawer motor
CCW
STOP
CW
Recognition
Switches
SW 2
SW 3
SW 4
SW 5
SW 6
SW 7
SW 8
Time 200ms/div

4. Select #1

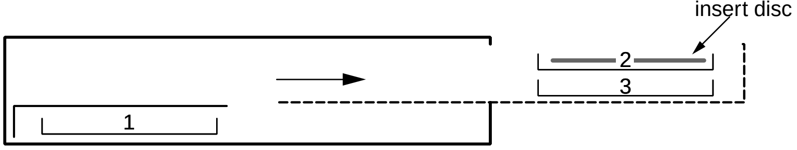

ACTION
select #1
3
1
2
initial
2
3
1
2
3
1
2
1
3
1
2
3
2
3
1
final
clamper
up
carriage#1
to play position
clamper
down
Action
Carriage motor
CCW
STOP
CW
Drawer motor
CCW
STOP
CW
Recognition
Switches
SW 2
SW 3
SW 4
SW 5
SW 6
SW 7
SW 8
Time 200ms/div

Load all discs

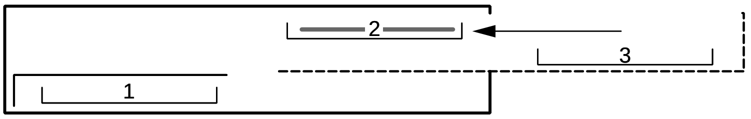
1. Power on. Initial state.



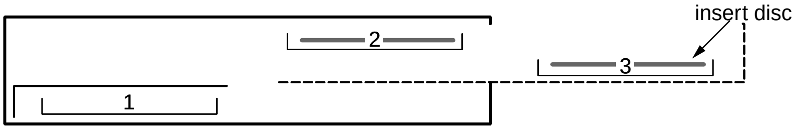
2. Press open #2.
   Tray moves out.
   Load carriage #2.


insert disc
2
3
1

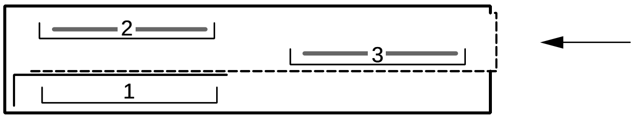
3. Press open #3.
   Carriage #2 moves in extra position.



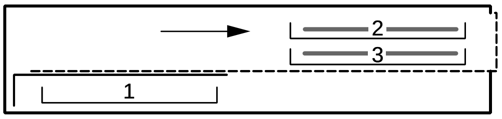
4. Load carriage #3.


insert disc
2
3
1

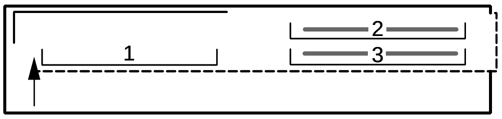
5. Press open #1.
   Tray closes.



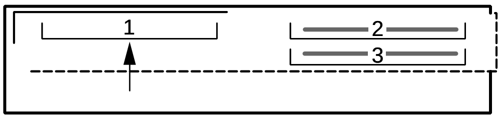
6. Carriage #2 moves in home position.



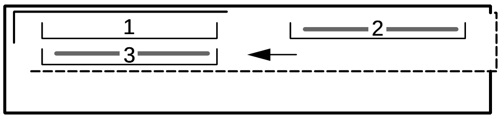
7. Clamper moves to upper position.
   Carriage #1 moves to height of carriage #3.



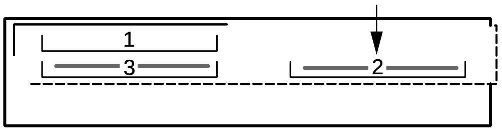
8. Carriage #1 moves to height of carriage #2.



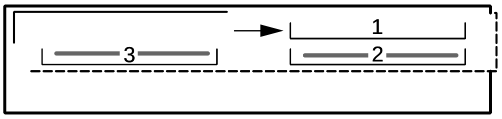
9. Carriage #3 moves below carriage #1.



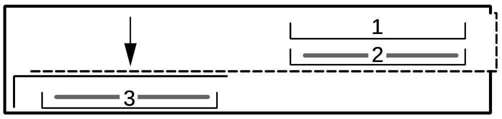
10. Carriage #2 moves down.



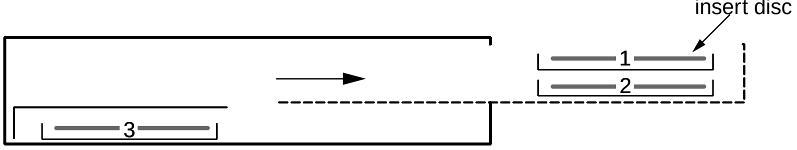
11. Carriage #1 moves in home position.



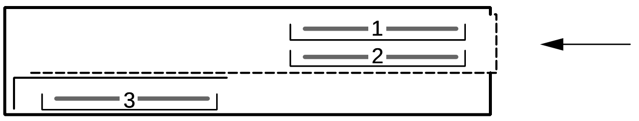
12. Carriage #3 and clamper move down (in play position).



13. Tray moves out.
    Load carriage #1.

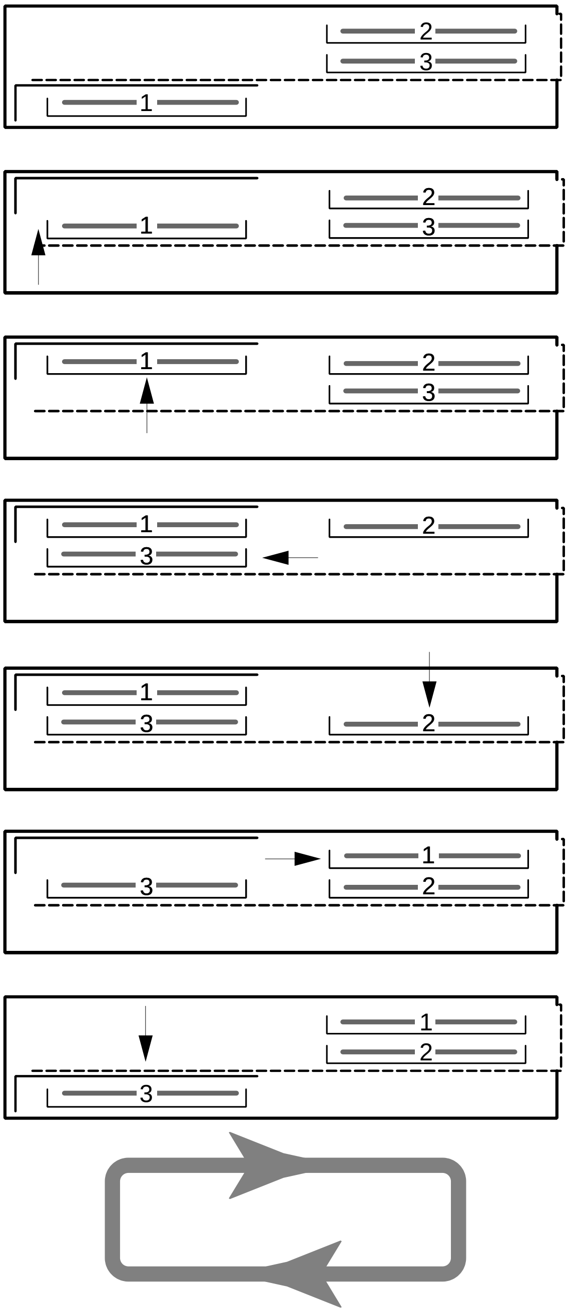

insert disc
1
2
3

14. Press close.
    Tray closes.



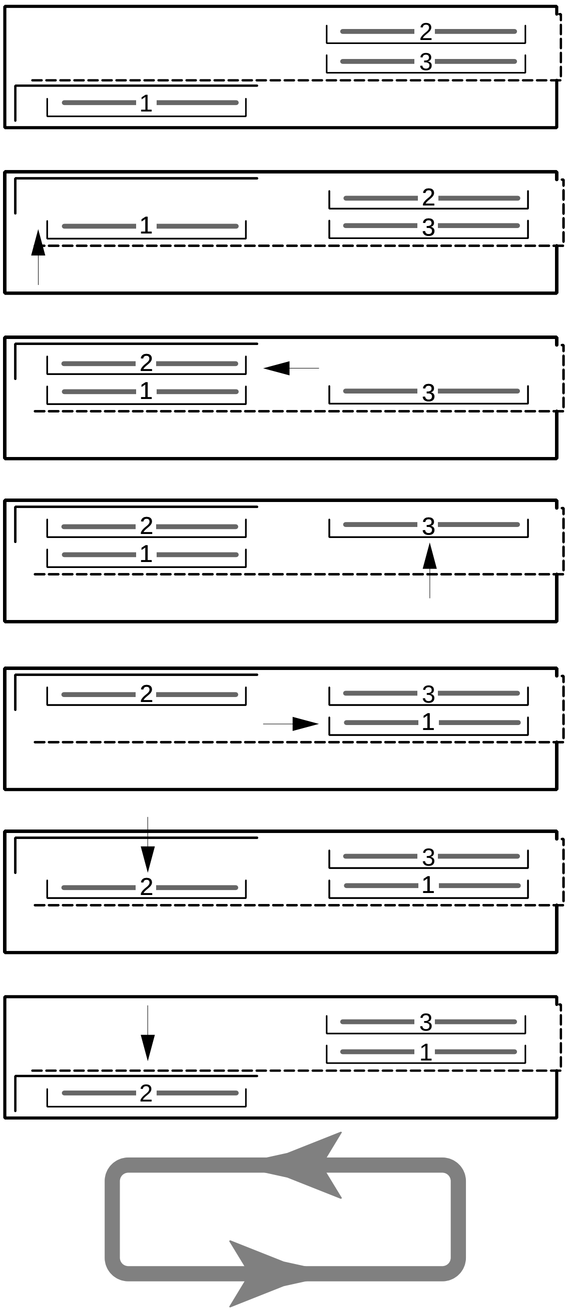
Change *‘backwards’*

E.g. select #3 while playing #1.


2
3
1
2
1
3
1
2
3
1
2
3
1
3
2
1
3
2
1
2
3

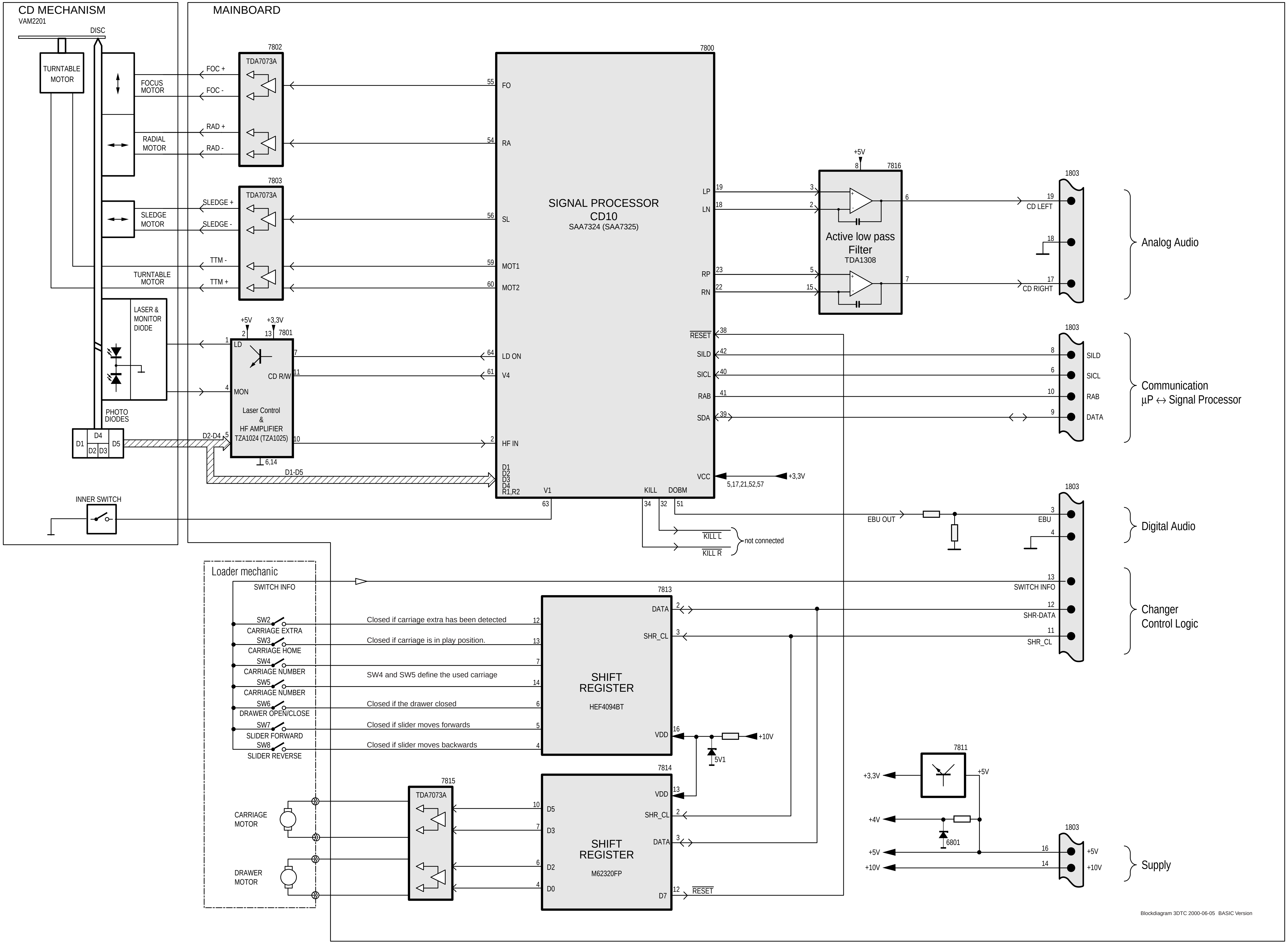
Change *‘forwards’*

E.g. select #2 while playing #1.


2
3
1
2
1
3
2
1
3
2
3
1
2
3
1
3
2
1
3
1
2

See also timing diagrams (page 10-8).

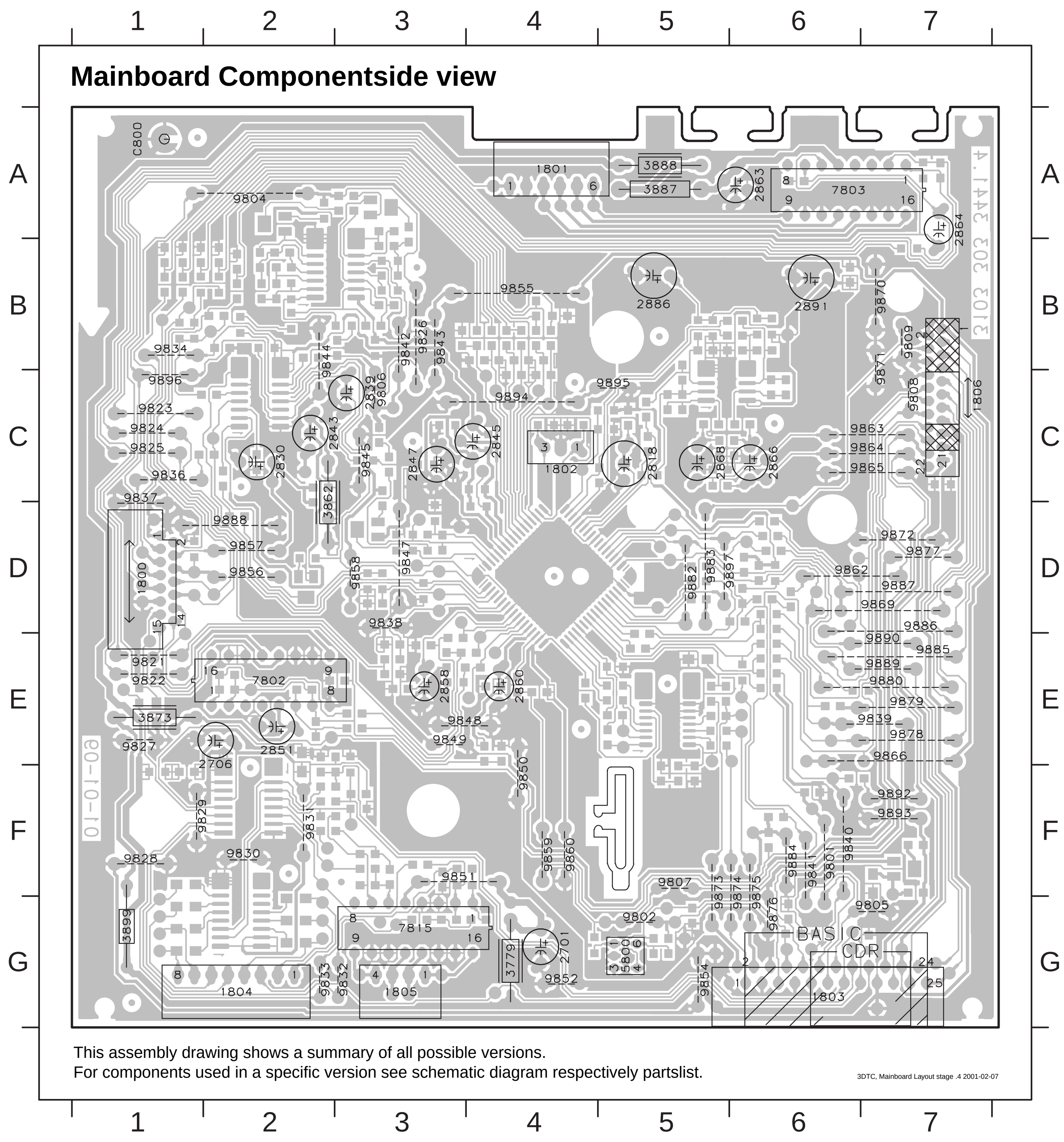
BLOCK DIAGRAM 3DTC


CD MECHANISM
VAM2201
DISC
TURNTABLE MOTOR
FOCUS MOTOR
RADIAL MOTOR
SLEDGE MOTOR
TURNTABLE MOTOR
LASER & MONITOR DIODE
PHOTO DIODES
D1
D4
D2
D3
D5
INNER SWITCH
MAINBOARD
7802
TDA7073A
FOC +
FOC -
RAD +
RAD -
7803
TDA7073A
SLEDGE +
SLEDGE -
TTM -
TTM +
+5V
+3,3V
7801
LD
MON
CD R/W
Laser Control & HF AMPLIFIER
TZA1024 (TZA1025)
6,14
D2-D4
D1-D5
7800
SIGNAL PROCESSOR
CD10
SAA7324 (SAA7325)
55 FO
54 RA
56 SL
59 MOT1
60 MOT2
64 LD ON
61 V4
2 HF IN
D1
D2
D3
D4
R1,R2
V1
63
KILL
34
32
DOBM
51
LP 19
LN 18
RP 23
RN 22
RESET 38
SILD 42
SICL 40
RAB 41
SDA 39
VCC
5,17,21,52,57
+3,3V
KILL L
KILL R
not connected
EBU OUT
+5V
7816
Active low pass Filter
TDA1308
1803
CD LEFT 19
18
CD RIGHT 17
Analog Audio
SILD 8
SICL 6
RAB 10
DATA 9
Communication
µP ↔ Signal Processor
EBU 3
4
Digital Audio
SWITCH INFO 13
SHR-DATA 12
SHR_CL 11
Changer Control Logic
Loader mechanic
SWITCH INFO
SW2 CARRIAGE EXTRA
SW3 CARRIAGE HOME
SW4 CARRIAGE NUMBER
SW5 CARRIAGE NUMBER
SW6 DRAWER OPEN/CLOSE
SW7 SLIDER FORWARD
SW8 SLIDER REVERSE
Closed if carriage extra has been detected
Closed if carriage is in play position.
SW4 and SW5 define the used carriage
Closed if the drawer closed
Closed if slider moves forwards
Closed if slider moves backwards
7813
DATA
SHR_CL
SHIFT REGISTER
HEF4094BT
VDD
+10V
5V1
7814
VDD
SHR_CL
DATA
SHIFT REGISTER
M62320FP
D5
D3
D2
D0
D7
RESET
7815
TDA7073A
CARRIAGE MOTOR
DRAWER MOTOR
7811
+3,3V
+5V
+4V
6801
+5V
+10V
1803
+5V 16
+10V 14
Supply
Blockdiagram 3DTC 2000-06-05 BASIC Version

1800	D1	2706	E2	2858	E3	3779	G4	7803	A6	9808	C7	9827	E1	9836	C1	9844	B2	9854	G5	9863	C7	9873	F5	9882	D5	9890	E7
1801	A4	2818	C5	2860	E4	3862	D2	7815	G3	9809	B7	9828	F1	9837	C1	9845	C3	9855	B4	9864	C7	9874	F6	9883	D5	9892	F7
1802	C4	2830	C2	2863	A6	3873	E1	9801	F6	9821	E1	9829	F1	9838	D3	9847	D3	9856	D2	9865	C7	9875	F6	9884	F6	9893	F7
1803	G6	2839	C3	2864	A7	3887	A5	9802	G5	9822	E1	9830	F2	9839	E7	9848	E3	9857	D2	9866	E7	9876	G6	9885	E7	9894	C4
1804	G2	2843	C2	2866	C6	3888	A5	9804	A2	9823	C1	9831	F2	9840	F6	9849	E3	9858	D3	9869	D7	9877	D7	9886	D7	9895	C5
1805	G3	2845	C4	2868	C5	3899	G1	9805	G7	9824	C1	9832	G3	9841	F6	9850	F4	9859	F4	9870	B7	9878	E7	9887	D7	9896	C1
1806	C7	2847	C3	2886	B5	5800	G5	9806	C3	9825	C1	9833	G2	9842	B3	9851	F3	9860	F4	9871	B7	9879	E7	9888	D2	9897	D6
2701	G4	2851	E2	2891	B6	7802	E2	9807	F5	9826	B3	9834	B1	9843	B3	9852	G4	9862	D6	9872	D7	9880	E7	9889	E7	C800	A1

2700	B3	2814	F1	2842	E4	2867	E5	2895	E5	3725	B6	3743	C4	3759	E5	3776	A3	3794	G3	3817	F1	3845	C5	3860	D6	3877	C3	3897	G3	7804	D3
2703	B3	2815	F1	2844	D3	2869	E5	3700	F3	3726	D6	3744	A5	3760	F6	3777	A3	3795	F2	3818	F4	3846	C1	3861	E2	3878	C4	3898	F3	7806	D2
2704	B2	2816	F4	2846	C2	2878	B5	3701	F2	3727	D6	3745	C5	3761	F5	3778	B3	3796	F3	3820	F2	3847	C6	3863	E4	3879	C2	6801	B7	7811	B7
2705	F2	2817	E5	2848	C3	2879	A4	3702	E6	3728	D5	3746	C5	3762	F6	3780	B1	3797	F2	3821	F4	3848	C6	3864	E3	3880	D3	6802	C5	7812	C5
2707	F3	2819	E4	2849	D3	2880	A5	3703	E6	3729	D6	3747	C5	3763	F5	3781	B3	3805	F4	3822	D6	3849	C6	3865	C6	3881	D3	6804	A2	7813	A2
2708	F3	2820	E4	2850	E3	2881	A5	3713	F3	3730	F2	3748	C5	3764	E6	3782	B3	3806	F4	3823	D6	3850	D6	3866	D4	3882	D3	6805	A2	7814	B2
2709	F2	2821	F2	2852	C4	2882	B5	3715	C6	3731	G2	3750	C5	3765	E5	3783	A7	3807	F1	3829	D2	3851	F1	3867	E3	3883	C3	6806	A2	7816	E5
2710	F3	2822	F4	2853	D3	2885	F6	3716	C6	3733	B7	3751	C5	3766	F3	3784	B2	3808	F4	3830	E2	3852	D6	3868	E3	3884	G7	6807	B1	7818	F3
2711	F2	2828	F2	2854	D3	2887	F6	3717	D6	3735	B7	3752	C4	3768	F3	3786	B1	3809	F1	3831	F2	3853	F2	3869	C3	3885	C3	6808	A1	7819	G2
2712	B3	2829	F3	2855	C2	2888	F5	3718	B6	3736	C6	3753	A6	3770	G3	3787	B3	3810	F4	3833	F4	3854	B6	3870	C4	3886	C4	6809	A1	7820	G3
2713	F3	2831	D5	2856	C3	2889	E6	3719	E5	3737	B5	3754	B6	3771	B3	3788	B2	3811	D2	3835	F2	3855	F2	3871	C2	3889	C3	6810	A1		
2810	E4	2832	E2	2859	D3	2890	E5	3720	E5	3738	C5	3755	F6	3772	B2	3789	B2	3812	D2	3836	F1	3856	F2	3872	C4	3890	G6	6811	C2		
2811	F1	2833	D5	2861	G7	2892	E5	3722	F2	3740	C5	3756	F6	3773	A4	3790	B3	3813	F4	3840	D6	3857	D6	3874	D3	3891	C3	6812	C1		
2812	F4	2834	D1	2862	C3	2893	E7	3723	A6	3741	C5	3757	F6	3774	B3	3791	B3	3814	E5	3841	C4	3858	D6	3875	E3	3892	F7	7800	D4		
2813	E4	2836	E2	2865	C3	2894	E5	3724	A6	3742	C5	3758	E5	3775	B3	3793	G3	3816	E5	3844	C5	3859	E2	3876	C3	3893	E3	7801	E2		

Mainboard Componentside view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BASIC
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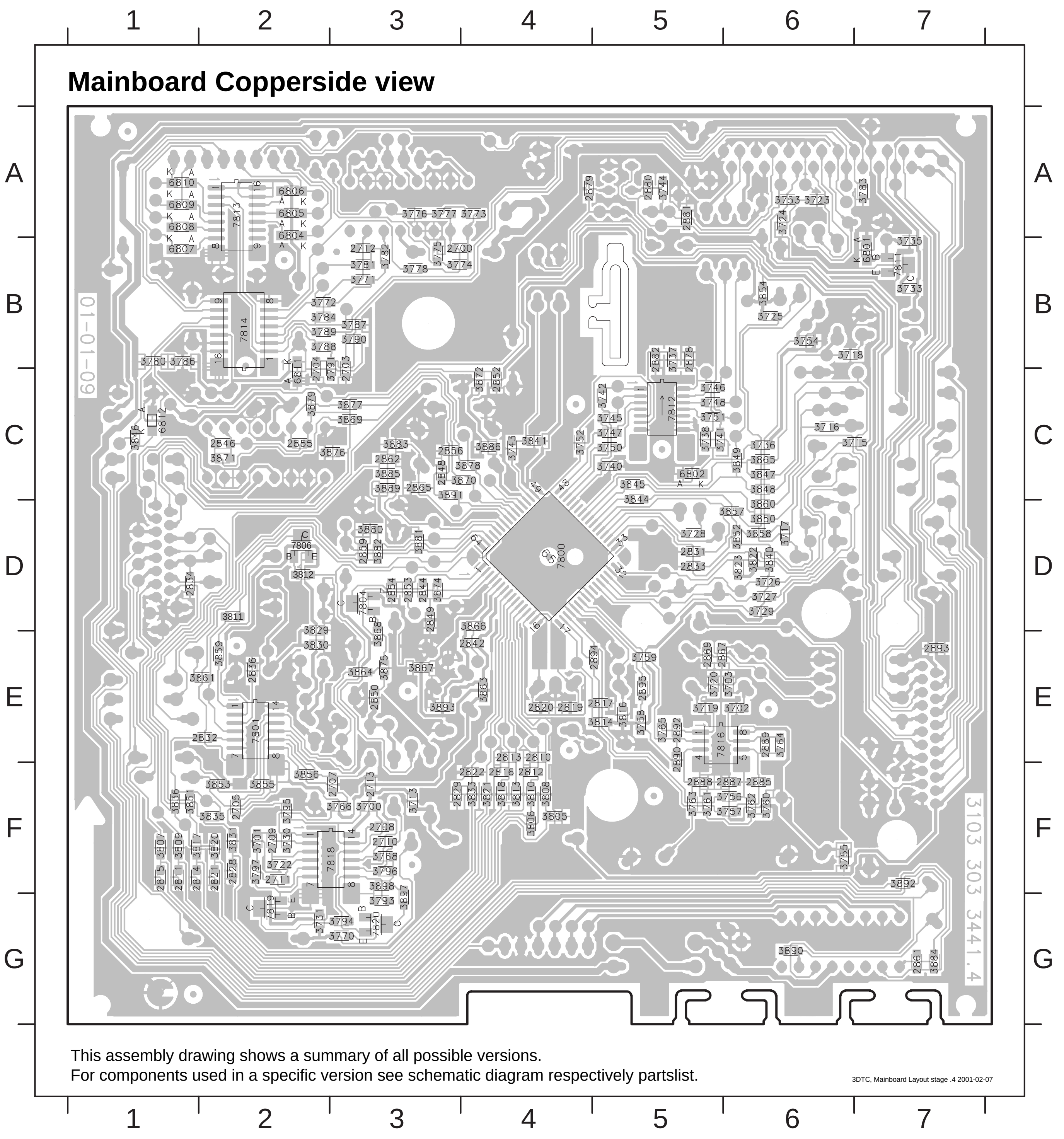
3103 303 3441.4
60-10-10

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

3DTC, Mainboard Layout stage .4 2001-02-07

Mainboard Copperside view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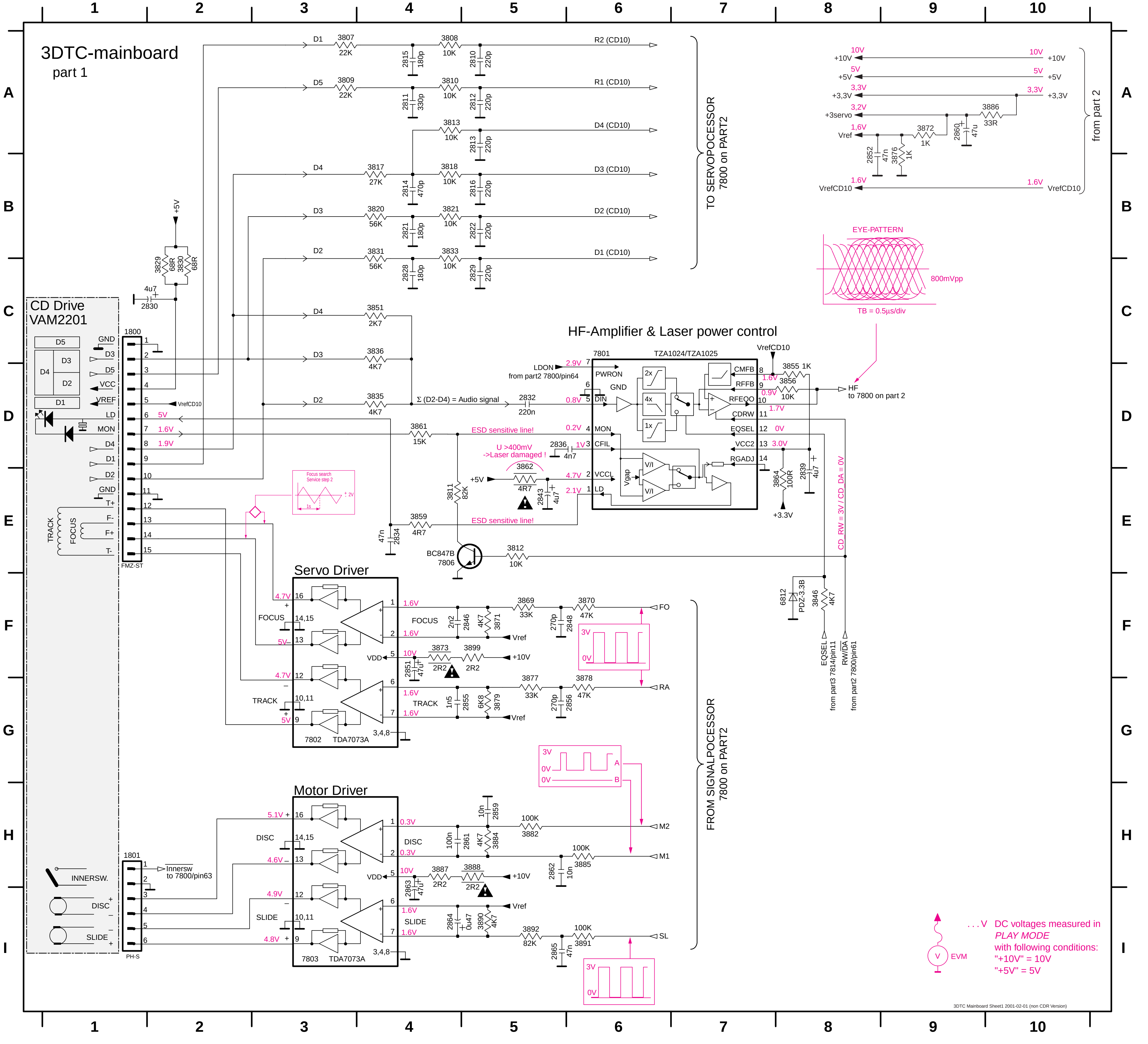
3103 303 3441.4
01-01-09

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

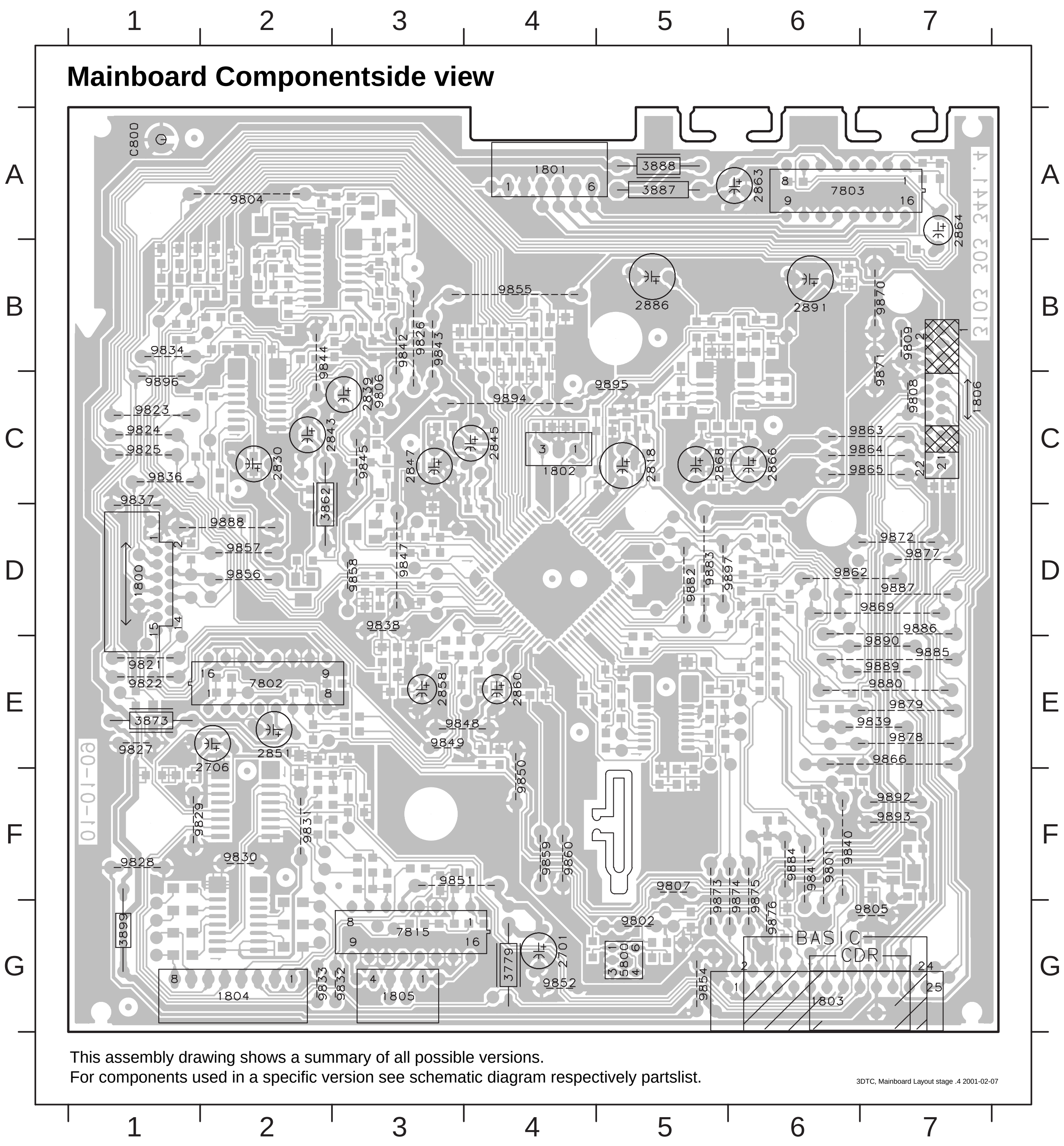
3DTC, Mainboard Layout stage .4 2001-02-07

1800	C1	2813	A5	2822	B5	2834	E4	2848	F5	2859	H5	2864	I4	3810	A4	3821	B4	3835	D4	3856	D8	3869	F5	3876	B9	3884	H5	3890	I5	7801	D6
1801	I1	2814	B4	2828	C4	2836	D6	2851	F4	2860	B9	2865	I5	3813	A4	3829	C2	3836	C4	3859	E4	3870	F6	3877	G5	3885	H6	3891	I6	7802	G3
2810	A5	2815	A4	2829	C5	2839	E8	2852	B8	2861	H4	3807	A3	3817	B4	3830	C2	3846	F8	3861	D4	3871	F5	3878	G6	3886	A10	3892	I5	7803	I3
2811	A4	2816	B5	2830	C2	2843	E5	2855	G4	2862	H5	3808	A4	3818	B4	3831	B4	3851	C4	3862	E5	3872	B9	3879	G5	3887	H4	3899	F5		
2812	A4	2821	B4	2832	D5	2846	F4	2856	G5	2863	H4	3809	A3	3820	B4	3833	B4	3855	D8	3864	E8	3873	F4	3882	H5	3888	H5	6812	F8		


3DTC-mainboard
part 1
1 2 3 4 5 6 7 8 9 10
A B C D E F G H I
CD Drive VAM2201
1800
GND D3 D5 VCC VREF LD MON D4 D1 D2 GND T+ F- F+ T-
D5 D3 D4 D2 D1
TRACK FOCUS
FMZ-ST
+5V
3829 68R 3830 68R
4u7 2830
VrefCD10
5V 1.6V 1.9V
D1 3807 22K 3808 10K 2815 180p 2810 220p R2 (CD10)
D5 3809 22K 3810 10K 2811 330p 2812 220p R1 (CD10)
3813 10K 2813 220p D4 (CD10)
D4 3817 27K 3818 10K 2814 470p 2816 220p D3 (CD10)
D3 3820 56K 3821 10K 2821 180p 2822 220p D2 (CD10)
D2 3831 56K 3833 10K 2828 180p 2829 220p D1 (CD10)
TO SERVOPROCESSOR 7800 on PART2
10V +10V 10V +10V
5V +5V 5V +5V
3,3V +3,3V 3,3V +3,3V
3,2V +3servo 3886 33R
1.6V Vref 3872 1K 2860 47u
2852 47n 3876 1K
1.6V VrefCD10 1.6V VrefCD10
from part 2
EYE-PATTERN
800mVpp
TB = 0.5µs/div
HF-Amplifier & Laser power control
D4 3851 2K7
D3 3836 4K7
D2 3835 4K7
Σ (D2-D4) = Audio signal
2832 220n
7801 TZA1024/TZA1025
VrefCD10
LDON from part2 7800/pin64
2.9V 7 PWRON
6 GND
0.8V 5 DIN
0.2V 4 MON
1V 3 CFIL
4.7V 2 VCCL
2.1V 1 LD
2x 4x 1x
Vgap V/I V/I
CMFB 8
RFFB 9
RFEQO 10
CDRW 11
EQSEL 12 0V
VCC2 13 3.0V
RGADJ 14
1.6V 0.9V 1.7V
3855 1K 3856 10K
HF to 7800 on part 2
3864 100R 2839 4u7
+3.3V
3861 15K
ESD sensitive line!
2836 4n7
U >400mV ->Laser damaged !
3862 4R7
+5V
2843 4u7
3811 82K
3859 4R7
ESD sensitive line!
47n 2834
BC847B 7806
3812 10K
Focus search Service step 2
+2V 1s
CD RW = 3V / CD DA = 0V
6812 PD2-3.3B
3846 4K7
EQSEL from part3 7814/pin11
RW/DA from part2 7800/pin61
Servo Driver
4.7V 16
FOCUS 14,15
5V 13
10V 5 VDD
4.7V 12
TRACK 10,11
5V 9
3,4,8
7802 TDA7073A
1 1.6V
2 1.6V
6 1.6V
7 1.6V
FOCUS 2n2 2846 4K7 3871
3869 33K 3870 47K 270p 2848 FO
Vref
3873 2R2 3899 2R2 +10V
2851 47u
3877 33K 3878 47K RA
TRACK 1n5 2855 6K8 3879 270p 2856
Vref
3V 0V
3V 0V A
0V B
Motor Driver
5.1V 16
DISC 14,15
4.6V 13
10V 5 VDD
4.9V 12
SLIDE 10,11
4.8V 9
3,4,8
7803 TDA7073A
1 0.3V
2 0.3V
6 1.6V
7 1.6V
10n 2859
100K 3882 M2
DISC 100n 2861 4K7 3884
100K 3885 M1
2862 10n
3887 2R2 3888 2R2 +10V
2863 47u
Vref
SLIDE 2864 0u47 3890 4K7
3892 82K 100K 3891 SL
2865 47n
3V 0V
1801
INNERSW. DISC SLIDE
Innersw to 7800/pin63
PH-S
FROM SIGNALPROCESSOR 7800 on PART2
V EVM
. . . V DC voltages measured in PLAY MODE with following conditions: "+10V" = 10V "+5V" = 5V
3DTC Mainboard Sheet1 2001-02-01 (non CDR Version)

1800	D1	2706	E2	2858	E3	3779	G4	7803	A6	9808	C7	9827	E1	9836	C1	9844	B2	9854	G5	9863	C7	9873	F5	9882	D5	9890	E7
1801	A4	2818	C5	2860	E4	3862	D2	7815	G3	9809	B7	9828	F1	9837	C1	9845	C3	9855	B4	9864	C7	9874	F6	9883	D5	9892	F7
1802	C4	2830	C2	2863	A6	3873	E1	9801	F6	9821	E1	9829	F1	9838	D3	9847	D3	9856	D2	9865	C7	9875	F6	9884	F6	9893	F7
1803	G6	2839	C3	2864	A7	3887	A5	9802	G5	9822	E1	9830	F2	9839	E7	9848	E3	9857	D2	9866	E7	9876	G6	9885	E7	9894	C4
1804	G2	2843	C2	2866	C6	3888	A5	9804	A2	9823	C1	9831	F2	9840	F6	9849	E3	9858	D3	9869	D7	9877	D7	9886	D7	9895	C5
1805	G3	2845	C4	2868	C5	3899	G1	9805	G7	9824	C1	9832	G3	9841	F6	9850	F4	9859	F4	9870	B7	9878	E7	9887	D7	9896	C1
1806	C7	2847	C3	2886	B5	5800	G5	9806	C3	9825	C1	9833	G2	9842	B3	9851	F3	9860	F4	9871	B7	9879	E7	9888	D2	9897	D6
2701	G4	2851	E2	2891	B6	7802	E2	9807	F5	9826	B3	9834	B1	9843	B3	9852	G4	9862	D6	9872	D7	9880	E7	9889	E7	C800	A1

Mainboard Componentside view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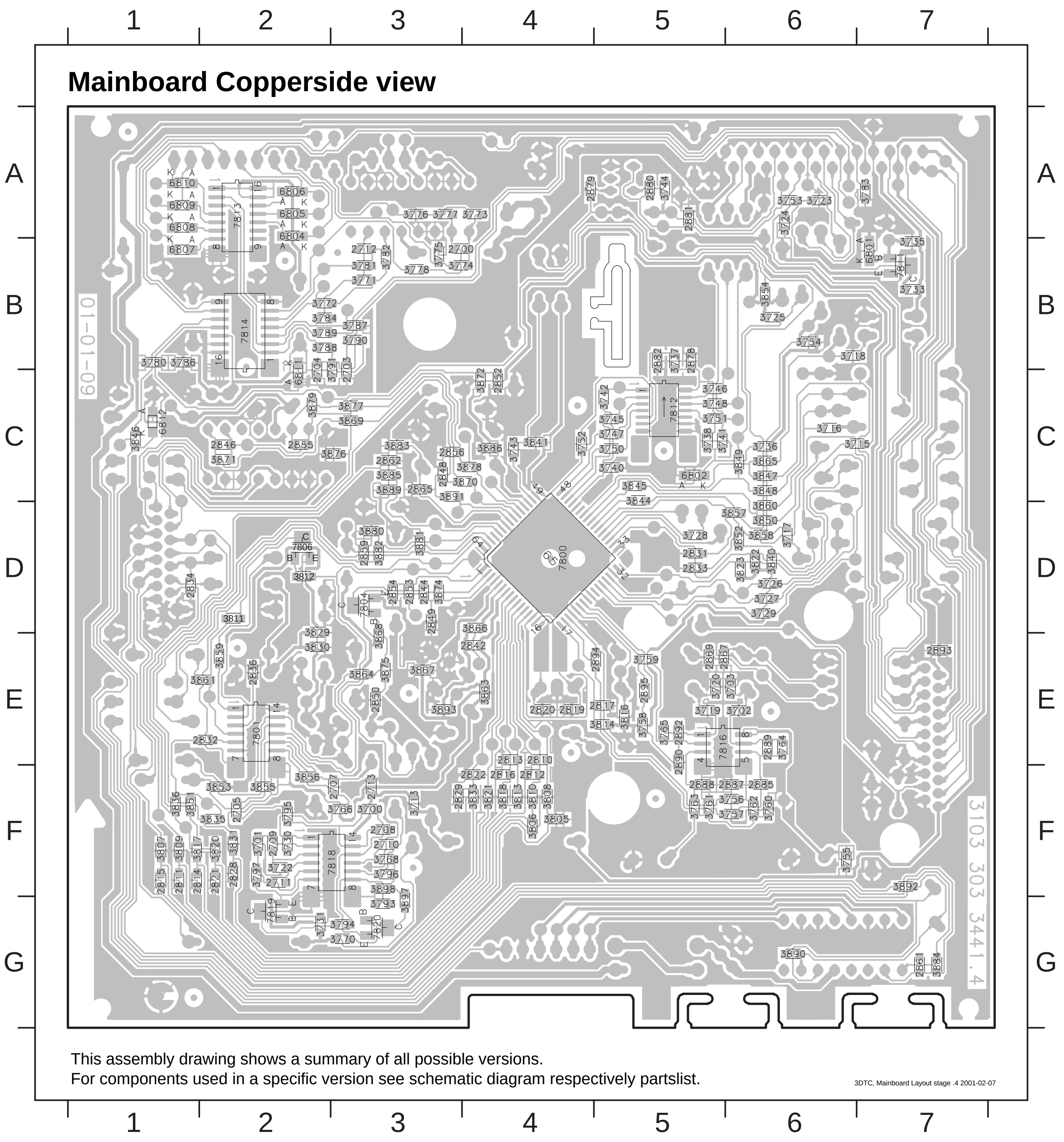
01-01-09

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

3DTC, Mainboard Layout stage .4 2001-02-07

2700	B3	2814	F1	2842	E4	2867	E5	2895	E5	3725	B6	3743	C4	3759	E5	3776	A3	3794	G3	3817	F1	3845	C5	3860	D6	3877	C3	3897	G3	7804	D3
2703	B3	2815	F1	2844	D3	2869	E5	3700	F3	3726	D6	3744	A5	3760	F6	3777	A3	3795	F2	3818	F4	3846	C1	3861	E2	3878	C4	3898	F3	7806	D2
2704	B2	2816	F4	2846	C2	2878	B5	3701	F2	3727	D6	3745	C5	3761	F5	3778	B3	3796	F3	3820	F2	3847	C6	3863	E4	3879	C2	6801	B7	7811	B7
2705	F2	2817	E5	2848	C3	2879	A4	3702	E6	3728	D5	3746	C5	3762	F6	3780	B1	3797	F2	3821	F4	3848	C6	3864	E3	3880	D3	6802	C5	7812	C5
2707	F3	2819	E4	2849	D3	2880	A5	3703	E6	3729	D6	3747	C5	3763	F5	3781	B3	3805	F4	3822	D6	3849	C6	3865	C6	3881	D3	6804	A2	7813	A2
2708	F3	2820	E4	2850	E3	2881	A5	3713	F3	3730	F2	3748	C5	3764	E6	3782	B3	3806	F4	3823	D6	3850	D6	3866	D4	3882	D3	6805	A2	7814	B2
2709	F2	2821	F2	2852	C4	2882	B5	3715	C6	3731	G2	3750	C5	3765	E5	3783	A7	3807	F1	3829	D2	3851	F1	3867	E3	3883	C3	6806	A2	7816	E5
2710	F3	2822	F4	2853	D3	2885	F6	3716	C6	3733	B7	3751	C5	3766	F3	3784	B2	3808	F4	3830	E2	3852	D6	3868	E3	3884	G7	6807	B1	7818	F3
2711	F2	2828	F2	2854	D3	2887	F6	3717	D6	3735	B7	3752	C4	3768	F3	3786	B1	3809	F1	3831	F2	3853	F2	3869	C3	3885	C3	6808	A1	7819	G2
2712	B3	2829	F3	2855	C2	2888	F5	3718	B6	3736	C6	3753	A6	3770	G3	3787	B3	3810	F4	3833	F4	3854	B6	3870	C4	3886	C4	6809	A1	7820	G3
2713	F3	2831	D5	2856	C3	2889	E6	3719	E5	3737	B5	3754	B6	3771	B3	3788	B2	3811	D2	3835	F2	3855	F2	3871	C2	3889	C3	6810	A1		
2810	E4	2832	E2	2859	D3	2890	E5	3720	E5	3738	C5	3755	F6	3772	B2	3789	B2	3812	D2	3836	F1	3856	F2	3872	C4	3890	G6	6811	C2		
2811	F1	2833	D5	2861	G7	2892	E5	3722	F2	3740	C5	3756	F6	3773	A4	3790	B3	3813	F4	3840	D6	3857	D6	3874	D3	3891	C3	6812	C1		
2812	F4	2834	D1	2862	C3	2893	E7	3723	A6	3741	C5	3757	F6	3774	B3	3791	B3	3814	E5	3841	C4	3858	D6	3875	E3	3892	F7	7800	D4		
2813	E4	2836	E2	2865	C3	2894	E5	3724	A6	3742	C5	3758	E5	3775	B3	3793	G3	3816	E5	3844	C5	3859	E2	3876	C3	3893	E3	7801	E2		

Mainboard Copperside view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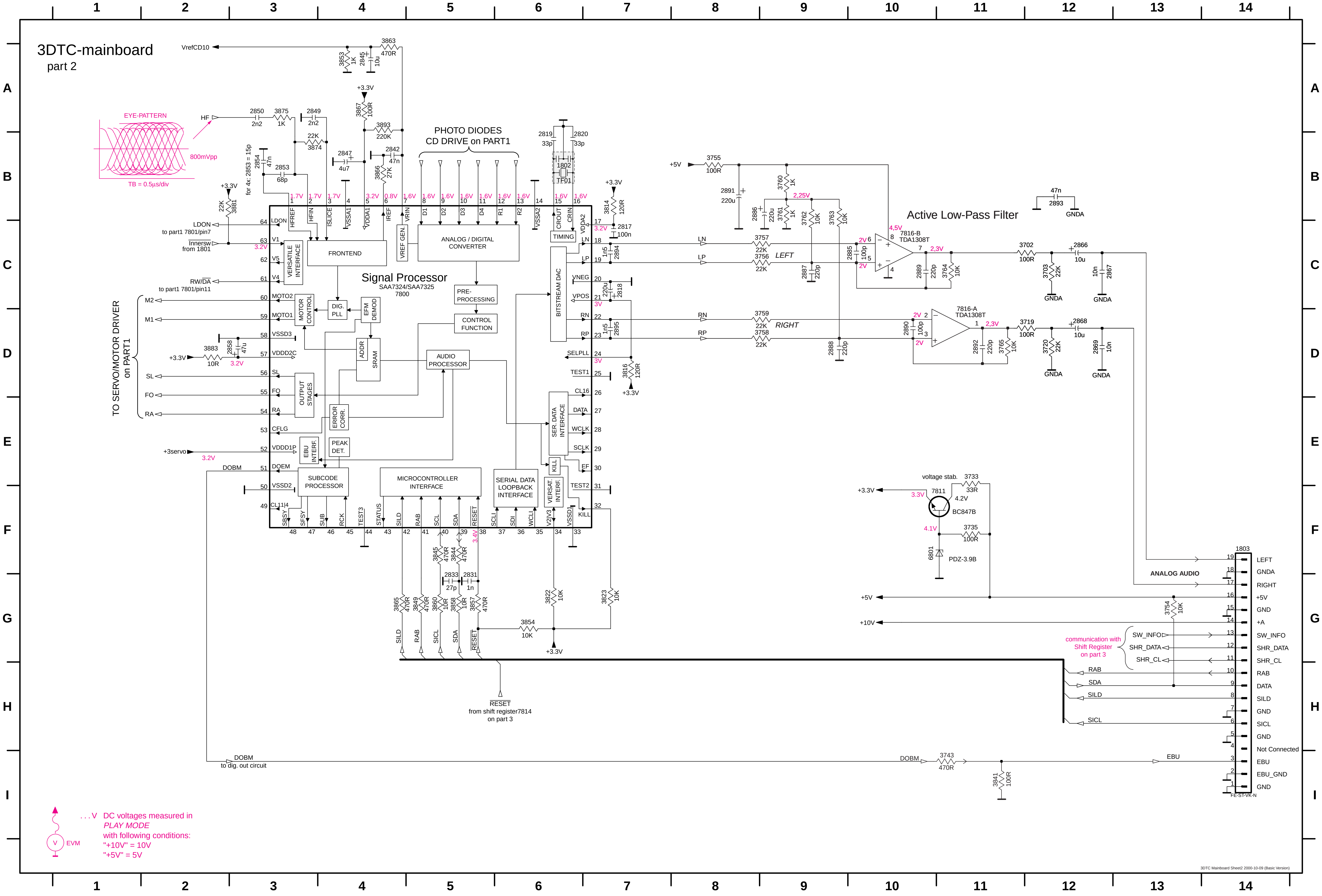
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

3DTC, Mainboard Layout stage .4 2001-02-07

1802	B6
1803	F14
2817	C7
2818	C7
2819	B6
2820	B6
2831	G5
2833	G5
2842	B4
2845	A4
2847	B4
2849	A3
2850	A3
2853	B3
2854	B3
2858	D3
2866	C12
2867	C12
2868	D12
2869	D12
2885	C10
2886	B9
2887	C9
2888	D9
2889	C10
2890	D10
2891	B8
2892	D11
2893	B12
2894	C7
2895	D7
3702	C12
3703	C12
3719	D12
3720	D12
3733	F11
3735	F11
3743	I11
3754	G13
3755	B8
3756	C9
3757	C9
3758	D9
3759	D9
3760	B9
3761	B9
3762	B9
3763	B9
3764	C11
3765	D11
3814	B7
3816	D7
3822	G6
3823	G7
3841	I11
3844	F5
3845	F5
3849	G5
3853	A4
3854	G6
3857	G5
3858	G5
3860	G5
3863	A4
3865	G4
3866	B4
3867	A4
3874	B3
3875	A3
3881	B3
3883	D2
3893	A4
6801	F10
7800	C4
7811	F10
7816-A	D11
7816-B	C10

3DTC-mainboard
part 2


1
2
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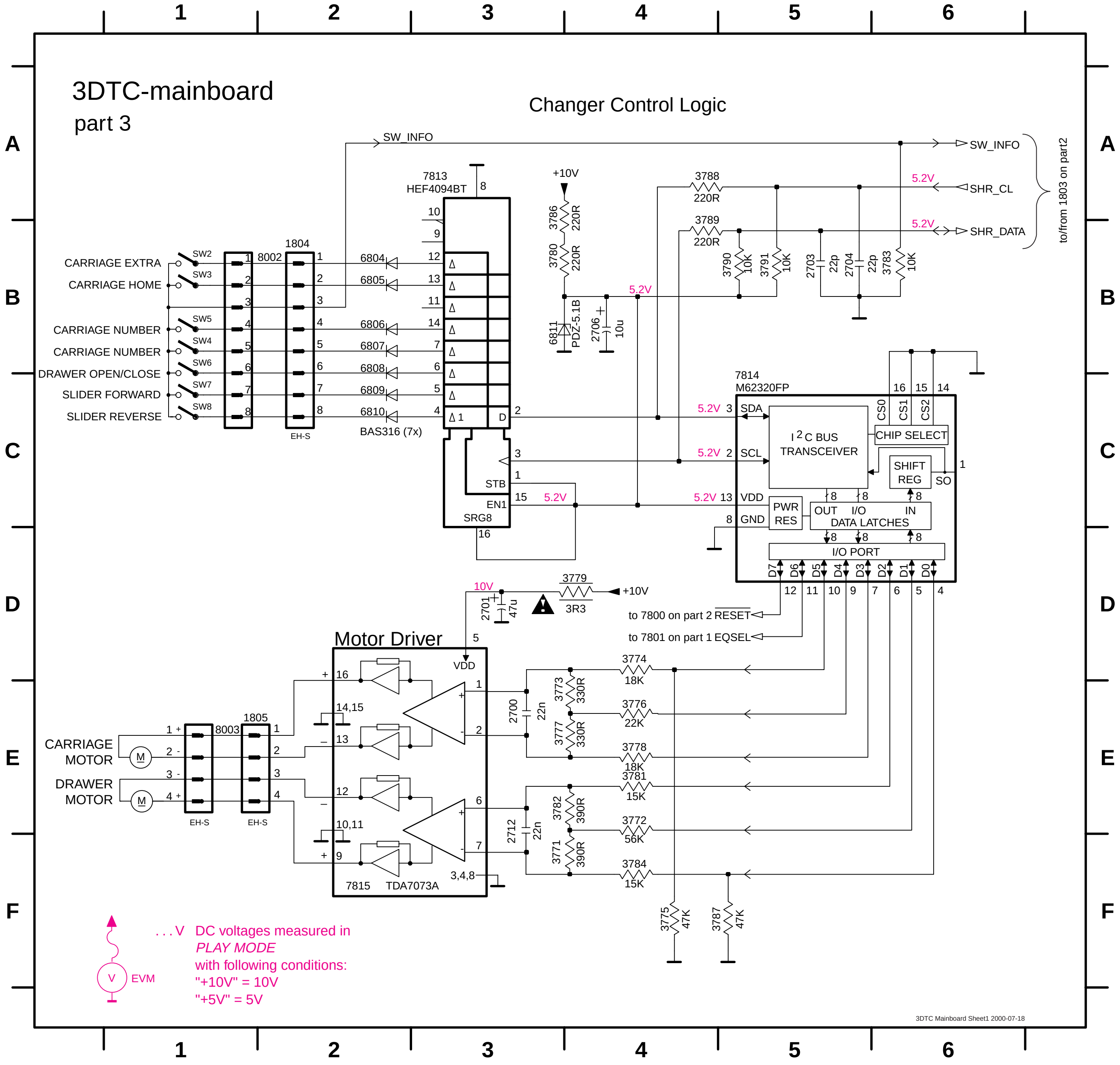
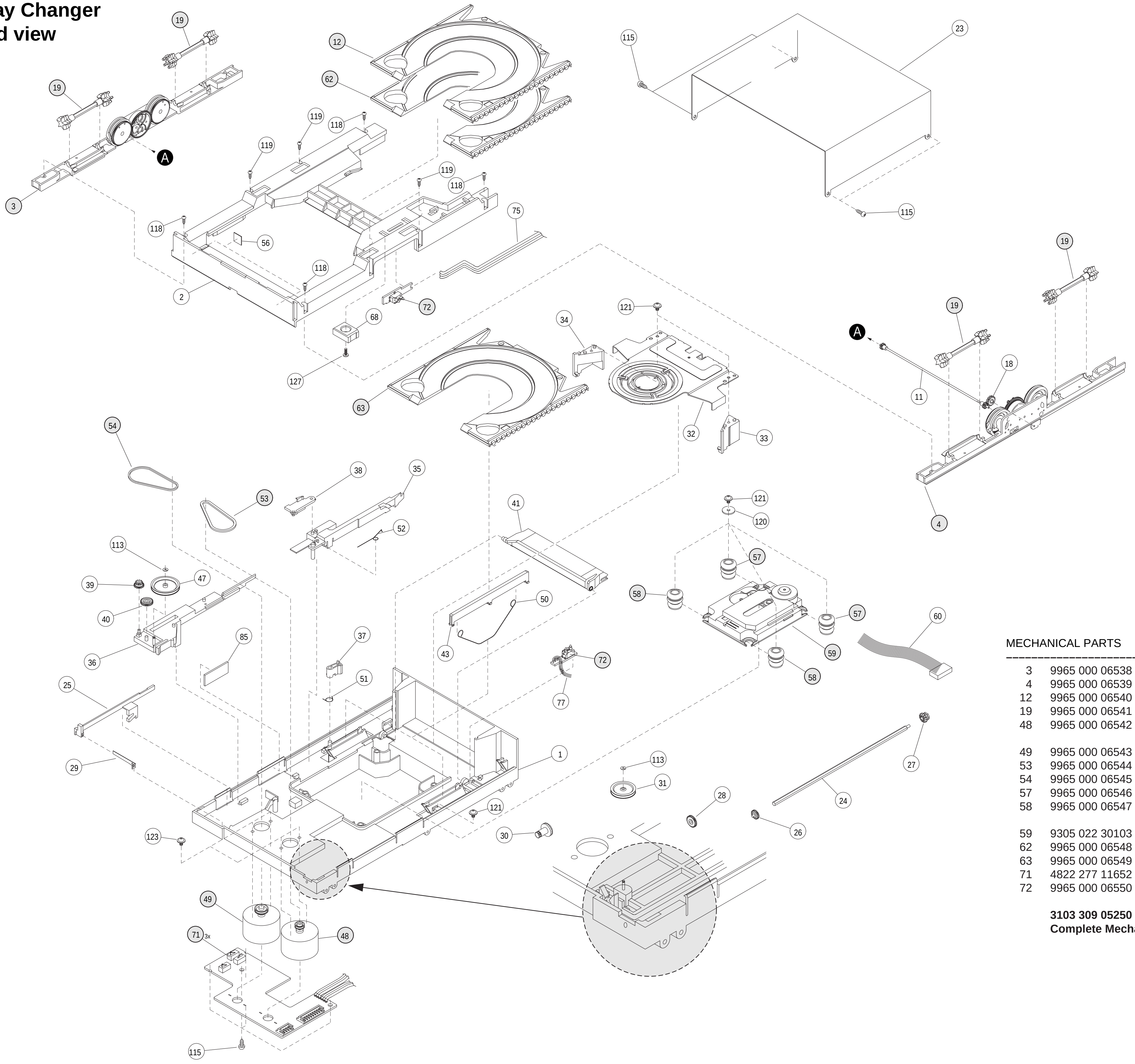
11
12
13
14
A
B
C
D
E
F
G
H
I
VrefCD10
3863
470R
3853
1K
2845
10u
+3.3V
3867
100R
3893
220K
EYE-PATTERN
HF
2850
2n2
3875
1K
2849
2n2
22K
3874
800mVpp
TB = 0.5µs/div
2847
4u7
2842
47n
3866
27K
2854
47n
for 4x: 2853 = 15p
2853
68p
+3.3V
22K
3881
PHOTO DIODES
CD DRIVE on PART1
2819
33p
2820
33p
1802
TF01
LDON
to part1 7801/pin7
Innersw
from 1801
RW/DA
to part1 7801/pin11
TO SERVO/MOTOR DRIVER
on PART1
M2
M1
+3.3V
3883
10R
2858
47u
3.2V
SL
FO
RA
+3servo
3.2V
DOBM
1.7V
1.7V
1.7V
3.2V
0.8V
1.6V
1.6V
1.6V
1.6V
1.6V
1.6V
1.6V
1.6V
1.6V
HFREF
HFIN
ISLICE
VSSA1
VDDA1
IREF
VRIN
D1
D2
D3
D4
R1
R2
VSSA2
CROUT
CRIN
VDDA2
LDON
V1
V5
V4
MOTO2
MOTO1
VSSD3
VDDD2C
SL
FO
RA
CFLG
VDDD1P
DOEM
VSSD2
CL11/4
SBSY
SFSY
SUB
RCK
TEST3
STATUS
SILD
RAB
SCL
SDA
RESET
SCLI
SDI
WCLI
V2/V3
VSSD1
KILL
LN
LP
VNEG
VPOS
RN
RP
SELPLL
TEST1
CL16
DATA
WCLK
SCLK
EF
TEST2
3V
3V
3V
3.2V
VERSATILE INTERFACE
FRONTEND
VREF GEN.
ANALOG / DIGITAL CONVERTER
TIMING
BITSTREAM DAC
Signal Processor
SAA7324/SAA7325
7800
PRE-PROCESSING
CONTROL FUNCTION
MOTOR CONTROL
DIG. PLL
EFM DEMOD
ADDR
SRAM
AUDIO PROCESSOR
OUTPUT STAGES
ERROR CORR.
EBU INTERF.
PEAK DET.
SUBCODE PROCESSOR
MICROCONTROLLER INTERFACE
SERIAL DATA LOOPBACK INTERFACE
VERSAT. INTERF.
KILL
SER. DATA INTERFACE
3814
120R
2817
100n
+3.3V
1n5
2894
220u
2818
1n5
2895
3816
120R
+3.3V
3.4V
3845
470R
3844
470R
2833
27p
2831
1n
3865
470R
3849
470R
3860
10R
3858
10R
3857
470R
3822
10K
3823
10K
3854
10K
+3.3V
SILD
RAB
SICL
SDA
RESET
RESET
from shift register7814
on part 3
DOBM
to dig. out circuit
+5V
3755
100R
2891
220u
3760
1K
2,25V
2886
220u
3761
1K
3762
10K
3763
10K
Active Low-Pass Filter
47n
2893
GNDA
4,5V
7816-B
TDA1308T
LN
LP
3757
22K
3756
22K
LEFT
2V
2V
2885
100p
2887
220p
2889
220p
3764
10K
2,3V
3702
100R
2866
10u
3703
22K
10n
2867
GNDA
GNDA
RN
RP
3759
22K
3758
22K
RIGHT
7816-A
TDA1308T
2V
2V
2890
100p
2888
220p
2892
220p
3765
10K
2,3V
3719
100R
2868
10u
3720
22K
2869
10n
GNDA
GNDA
voltage stab.
3733
33R
+3.3V
3.3V
7811
4.2V
BC847B
4.1V
3735
100R
6801
PDZ-3.9B
+5V
+10V
ANALOG AUDIO
3754
10K
communication with
Shift Register
on part 3
SW_INFO
SHR_DATA
SHR_CL
RAB
SDA
SILD
SICL
DOBM
3743
470R
3841
100R
EBU
1803
LEFT
GNDA
RIGHT
+5V
GND
+A
SW_INFO
SHR_DATA
SHR_CL
RAB
DATA
SILD
GND
SICL
GND
Not Connected
EBU
EBU_GND
GND
FE-ST-VK-N
V
EVM
. . . V
DC voltages measured in
PLAY MODE
with following conditions:
"+10V" = 10V
"+5V" = 5V
3DTC Mainboard Sheet2 2000-10-09 (Basic Version)

Technical remarks

1804	B2	2703	B5	3771	F4	3775	F4	3779	D4	3783	B6	3788	A4	6804	B2	6808	B2	7813	A3
1805	E1	2704	B5	3772	E4	3776	E4	3780	B3	3784	F4	3789	B4	6805	B2	6809	C2	7814	C5
2700	E3	2706	B4	3773	E4	3777	E4	3781	E4	3786	B3	3790	B5	6806	B2	6810	C2	7815	F2
2701	D3	2712	E3	3774	D4	3778	E4	3782	E4	3787	F5	3791	B5	6807	B2	6811	B3		


3DTC-mainboard
part 3
Changer Control Logic
SW_INFO
to/from 1803 on part2
SHR_CL
SHR_DATA
7813
HEF4094BT
+10V
3788 220R
3789 220R
3786 220R
3780 220R
3790 10K
3791 10K
2703 22p
2704 22p
3783 10K
5.2V
CARRIAGE EXTRA
CARRIAGE HOME
CARRIAGE NUMBER
CARRIAGE NUMBER
DRAWER OPEN/CLOSE
SLIDER FORWARD
SLIDER REVERSE
SW2
SW3
SW5
SW4
SW6
SW7
SW8
8002
1804
EH-S
6804
6805
6806
6807
6808
6809
6810
BAS316 (7x)
6811 PDZ-5.1B
2706 10u
STB
EN1
SRG8
7814
M62320FP
SDA
SCL
VDD
GND
I2C BUS TRANSCEIVER
CHIP SELECT
SHIFT REG
SO
PWR RES
OUT I/O IN
DATA LATCHES
I/O PORT
CS0 CS1 CS2
D7 D6 D5 D4 D3 D2 D1 D0
10V
2701 47u
3779 3R3
to 7800 on part 2 RESET
to 7801 on part 1 EQSEL
Motor Driver
VDD
CARRIAGE MOTOR
DRAWER MOTOR
M
8003
1805
2700 22n
2712 22n
3774 18K
3773 330R
3776 22K
3777 330R
3778 18K
3781 15K
3782 390R
3772 56K
3771 390R
3784 15K
3775 47K
3787 47K
7815 TDA7073A
3,4,8
...V DC voltages measured in PLAY MODE with following conditions:
"+10V" = 10V
"+5V" = 5V
V EVM
3DTC Mainboard Sheet1 2000-07-18
A B C D E F
1 2 3 4 5 6

3Disc Tray Changer
Exploded view


19
12
62
19
119
118
119
A
3
119
118
118
56
75
118
2
72
68
127
115
23
115
19
121
34
19
A
18
11
63
32
33
4
54
38
35
53
52
121
120
41
113
47
39
57
58
40
50
57
60
85
37
36
43
72
59
58
51
25
77
1
113
27
29
31
28
24
121
123
30
26
49
71 3x
48
115

MECHANICAL PARTS

3	9965 000 06538	ASSY HOLDER LEFT
4	9965 000 06539	ASSY HOLDER RIGHT
12	9965 000 06540	ASSY CARRIAGE 1 (TOP)
19	9965 000 06541	ASSY GEAR STAR
48	9965 000 06542	ASSY MOTOR CARRIAGE
49	9965 000 06543	ASSY MOTOR DRAWER
53	9965 000 06544	BELT DRAWER
54	9965 000 06545	BELT CARRIAGE
57	9965 000 06546	DAMPER RUBBER REAR
58	9965 000 06547	DAMPER RUBBER FRONT
59	9305 022 30103	CD DRIVE VAM2201/03
62	9965 000 06548	ASSY CARRIAGE 2 (MIDDLE)
63	9965 000 06549	ASSY CARRIAGE 3 (BOTTOM)
71	4822 277 11652	SWITCH (SW6-SW8)
72	9965 000 06550	SWITCH (SW2-SW5)
	3103 309 05250	**3DTC CMCJ-01-13 (1xSPEED)**
	Complete Mechanic - CD Drive already included	

MISCELLANEOUS

1800	4822 265 10925	FLEX FOIL CONNECTOR 15PIN
1803	4822 265 11545	FLEX FOIL CONNECTOR 19PIN
8003	3103 308 92560	FLEX FOIL CABLE 15P, 80mm
59	9305 022 30103	CD DRIVE VAM2201/03

CAPACITORS

2504	4822 124 40248	10µF	20%	63V
2506	4822 124 40433	47µF	20%	25V
2507	4822 124 40248	10µF	20%	63V
2508	4822 124 40248	10µF	20%	63V
2510	4822 124 40248	10µF	20%	63V
2513	4822 124 40248	10µF	20%	63V
2530	4822 124 40433	47µF	20%	25V
2532	4822 124 40433	47µF	20%	25V
2700 ©	4822 126 14494	22nF	10%	25V
2701	4822 124 40433	47µF	20%	25V
2703 ©	5322 122 32658	22pF	5%	50V
2704 ©	4822 122 33761	22pF	5%	50V
2706	4822 124 22833	10µF	20%	50V
2712 ©	4822 126 14494	22nF	10%	25V
2810 ©	4822 126 13883	220pF	5%	50V
2811 ©	4822 126 14241	330pF		50V
2812 ©	4822 126 13883	220pF	5%	50V
2813 ©	4822 126 13883	220pF	5%	50V
2814 ©	4822 126 13881	470pF	5%	50V
2815 ©	4822 126 14508	180pF	5%	50V
2816 ©	4822 126 13883	220pF	5%	50V
2817 ©	4822 126 14585	100nF	10%	50V
2818	4822 124 42383	220µF	20%	4V
2819 ©	5322 122 32659	33pF	5%	50V
2820 ©	5322 122 32659	33pF	5%	50V
2821 ©	4822 126 14508	180pF	5%	50V
2822 ©	4822 126 13883	220pF	5%	50V
2828 ©	4822 126 14508	180pF	5%	50V
2829 ©	4822 126 13883	220pF	5%	50V
2830	4822 124 40769	4,7µF	20%	100V
2831 ©	5322 126 11578	1nF	10%	63V
2832 ©	4822 126 13879	220nF	20%	16V
2833 ©	4822 126 11669	27pF	10%	50V
2834 ©	4822 126 13751	47nF	10%	50V
2836 ©	4822 126 13193	4,7nF	10%	63V
2839	4822 124 40769	4,7µF	20%	100V
2842 ©	4822 126 13751	47nF	10%	50V
2843	4822 124 40769	4,7µF	20%	100V
2845	4822 124 40248	10µF	20%	63V
2846 ©	4822 126 14238	2,2nF	10%	50V
2847	4822 124 40769	4,7µF	20%	100V
2848 ©	4822 126 14506	270pF	5%	50V
2849 ©	4822 122 33177	10nF	20%	50V
2850 ©	2238 786 11554	2,2nF	5%	16V
2851	4822 124 40433	47µF	20%	25V
2852 ©	3198 024 44730	47nF	5%	50V
2853 ©	4822 126 13694	68pF	1%	63V
2854 ©	4822 126 13751	47nF	10%	50V
2855 ©	4822 126 14247	1,5nF	10%	50V
2856 ©	4822 122 33216	270pF	5%	50V
2858	4822 124 12362	47µF	20%	4V
2859 ©	4822 122 33177	10nF	20%	50V
2860	4822 124 12362	47µF	20%	4V
2861 ©	4822 126 14585	100nF	10%	50V
2862 ©	5322 126 11583	10nF	10%	63V
2863	4822 124 40433	47µF	20%	25V
2864	5322 124 41948	0,47µF	20%	50V

CAPACITORS

2865 ©	3198 024 44730	47nF	5%	50V
2866	3198 028 41090	10µF	20%	35V
2867 ©	4822 122 33177	10nF	20%	50V
2868	3198 028 41090	10µF	20%	35V
2869 ©	4822 122 33177	10nF	20%	50V
2885 ©	4822 122 31765	100pF	5%	50V
2886	4822 124 42383	220µF	20%	4V
2887 ©	4822 126 13883	220pF	5%	50V
2888 ©	4822 126 13883	220pF	5%	50V
2889 ©	4822 126 13883	220pF	5%	50V
2890 ©	4822 122 31765	100pF	5%	50V
2891	4822 124 42383	220µF	20%	4V
2892 ©	4822 126 13883	220pF	5%	50V
2893 ©	4822 126 13751	47nF	10%	50V
2894 ©	4822 126 13344	1,5nF	5%	63V
2895 ©	4822 126 13344	1,5nF	5%	63V

RESISTORS

3502 ©	4822 051 20102	1kΩ	5%	0,1W
3505 ©	4822 051 20223	22kΩ	5%	0,1W
3512 ©	4822 117 10833	10kΩ	1%	0,1W
3515 ©	4822 117 10833	10kΩ	1%	0,1W
3517 ©	4822 117 10833	10kΩ	1%	0,1W
3534 ©	4822 117 12955	2,7kΩ	1%	0,1W
3535 ©	4822 051 20472	4,7kΩ	5%	0,1W
3536 ©	4822 117 12955	2,7kΩ	1%	0,1W
3537 ©	4822 051 20472	4,7kΩ	5%	0,1W
3702 ©	4822 051 30101	100Ω	5%	0,06W
3703 ©	4822 051 30223	22kΩ	5%	0,06W
3719 ©	4822 051 30101	100Ω	5%	0,06W
3720 ©	4822 051 30223	22kΩ	5%	0,06W
3733 ©	4822 051 30339	33Ω	5%	0,06W
3735 ©	4822 051 30101	100Ω	5%	0,06W
3743 ©	4822 051 30471	470Ω	5%	0,06W
3754 ©	4822 051 30103	10kΩ	5%	0,06W
3755 ©	4822 051 30101	100Ω	5%	0,06W
3756 ©	4822 051 30223	22kΩ	5%	0,06W
3757 ©	4822 051 30223	22kΩ	5%	0,06W
3758 ©	4822 051 30223	22kΩ	5%	0,06W
3759 ©	4822 051 20223	22kΩ	5%	0,1W
3760 ©	4822 051 10102	1kΩ	2%	0,25W
3761 ©	4822 051 10102	1kΩ	2%	0,25W
3762 ©	4822 117 10833	10kΩ	1%	0,1W
3763 ©	4822 117 10833	10kΩ	1%	0,1W
3764 ©	4822 051 30103	10kΩ	5%	0,06W
3765 ©	4822 051 30103	10kΩ	5%	0,06W
3771 ©	4822 051 30391	390Ω	5%	0,062W
3772 ©	4822 051 30563	56kΩ	5%	0,06W
3773 ©	4822 051 30331	330Ω	5%	0,06W
3774 ©	4822 051 30183	18kΩ	5%	0,06W
3775 ©	4822 117 12925	47kΩ	1%	0,06W
3776 ©	4822 051 30223	22kΩ	5%	0,06W
3777 ©	4822 051 30331	330Ω	5%	0,06W
3778 ©	4822 051 30183	18kΩ	5%	0,06W
3779 ⚠	4822 052 10338	3,3Ω		NFR25
3780 ©	4822 117 11503	220Ω	5%	0,1W
3781 ©	4822 051 30153	15kΩ	5%	0,06W
3782 ©	4822 051 30391	390Ω	5%	0,062W
3783 ©	4822 051 30103	10kΩ	5%	0,06W
3784 ©	4822 051 30153	15kΩ	5%	0,06W
3786 ©	4822 051 30221	220Ω	5%	0,06W
3787 ©	4822 117 10834	47kΩ	1%	0,1W
3788 ©	4822 051 30221	220Ω	5%	0,06W

RESISTORS

3789 ©	4822 051 30221	220Ω	5%	0,06W
3790 ©	4822 051 30103	10kΩ	5%	0,06W
3791 ©	4822 051 30103	10kΩ	5%	0,06W
3805	4822 111 50499	3,3MΩ	5%	0,2W
3806	4822 111 50499	3,3MΩ	5%	0,2W
3807 ©	4822 051 30223	22kΩ	5%	0,06W
3808 ©	4822 051 30103	10kΩ	5%	0,06W
3809 ©	4822 051 30223	22kΩ	5%	0,06W
3810 ©	4822 051 30103	10kΩ	5%	0,06W
3813 ©	4822 051 30103	10kΩ	5%	0,06W
3814 ©	4822 051 20121	120Ω	5%	0,1W
3816 ©	4822 051 30121	120Ω	5%	0,06W
3817 ©	4822 051 20273	27kΩ	5%	0,1W
3818 ©	4822 051 30103	10kΩ	5%	0,06W
3820 ©	4822 117 11148	56kΩ	1%	0,1W
3821 ©	4822 051 30103	10kΩ	5%	0,06W
3822 ©	4822 051 30103	10kΩ	5%	0,06W
3823 ©	4822 051 30103	10kΩ	5%	0,06W
3829 ©	4822 051 30689	68Ω	5%	0,06W
3830 ©	4822 051 30689	68Ω	5%	0,06W
3831 ©	4822 051 30563	56kΩ	5%	0,06W
3833 ©	4822 051 30103	10kΩ	5%	0,06W
3835 ©	4822 051 30472	4,7kΩ	5%	0,06W
3836 ©	4822 051 20472	4,7kΩ	5%	0,1W
3841 ©	4822 051 30101	100Ω	5%	0,06W
3844 ©	4822 051 30471	470Ω	5%	0,06W
3845 ©	4822 051 30471	470Ω	5%	0,06W
3846 ©	4822 051 30472	4,7kΩ	5%	0,06W
3849 ©	4822 051 20471	470Ω	5%	0,1W
3851 ©	4822 117 12955	2,7kΩ	1%	0,1W
3853 ©	4822 051 30102	1kΩ	5%	0,06W
3854 ©	4822 051 30103	10kΩ	5%	0,06W
3855 ©	4822 051 10102	1kΩ	2%	0,25W
3856 ©	4822 051 30103	10kΩ	5%	0,06W
3857 ©	4822 051 30471	470Ω	5%	0,06W
3858 ©	4822 051 30109	10Ω	5%	0,06W
3859 ©	4822 117 13608	4,7Ω	5%	0,06W
3860 ©	4822 051 20109	10Ω	5%	0,1W
3861 ©	4822 051 30101	100Ω	5%	0,06W
3862 ⚠	4822 052 10478	4,7Ω	5%	NFR
3863 ©	4822 051 20471	470Ω	5%	0,1W
3864 ©	4822 051 20101	100Ω	5%	0,1W
3865 ©	4822 051 20471	470Ω	5%	0,1W
3866 ©	4822 051 20273	27kΩ	5%	0,1W
3867 ©	4822 051 20101	100Ω	5%	0,1W
3869 ©	4822 051 30333	33kΩ	5%	0,06W
3870 ©	4822 117 12925	47kΩ	1%	0,06W
3871 ©	4822 051 30472	4,7kΩ	5%	0,06W
3872 ©	4822 051 30102	1kΩ	5%	0,06W
3873 ⚠	4822 052 10228	2,2Ω	5%	0,33W
3874 ©	4822 051 30223	22kΩ	5%	0,06W
3875 ©	4822 117 11817	1,2kΩ	1%	0,06W
3876 ©	4822 051 30102	1kΩ	5%	0,06W
3877 ©	4822 051 30333	33kΩ	5%	0,06W
3878 ©	4822 117 12925	47kΩ	1%	0,06W
3879 ©	4822 051 30682	6,8kΩ	5%	0,06W
3881 ©	4822 051 20223	22kΩ	5%	0,1W
3882 ©	4822 117 10837	100kΩ	1%	0,1W
3883 ©	4822 051 30109	10Ω	5%	0,06W
3884 ©	4822 051 30472	4,7kΩ	5%	0,06W
3885 ©	4822 117 13632	100kΩ	1%	0,06W
3886 ©	4822 051 30339	33Ω	5%	0,06W
3887	4822 053 10228	2,2Ω	5%	1W
3888 ⚠	4822 052 10228	2,2Ω	5%	0,33W

RESISTORS

3890 ©	4822 051 30472	4,7kΩ	5%	0,06W
3891 ©	4822 117 13632	100kΩ	1%	0,06W
3892 ©	4822 117 11149	82kΩ	1%	0,1W
3893 ©	4822 117 13579	220kΩ	1%	0.1W
3899	4822 116 81154	2,2Ω	5%	0,5W

COILS

1802	2422 543 01068	RESONATOR 8MHZ

DIODES

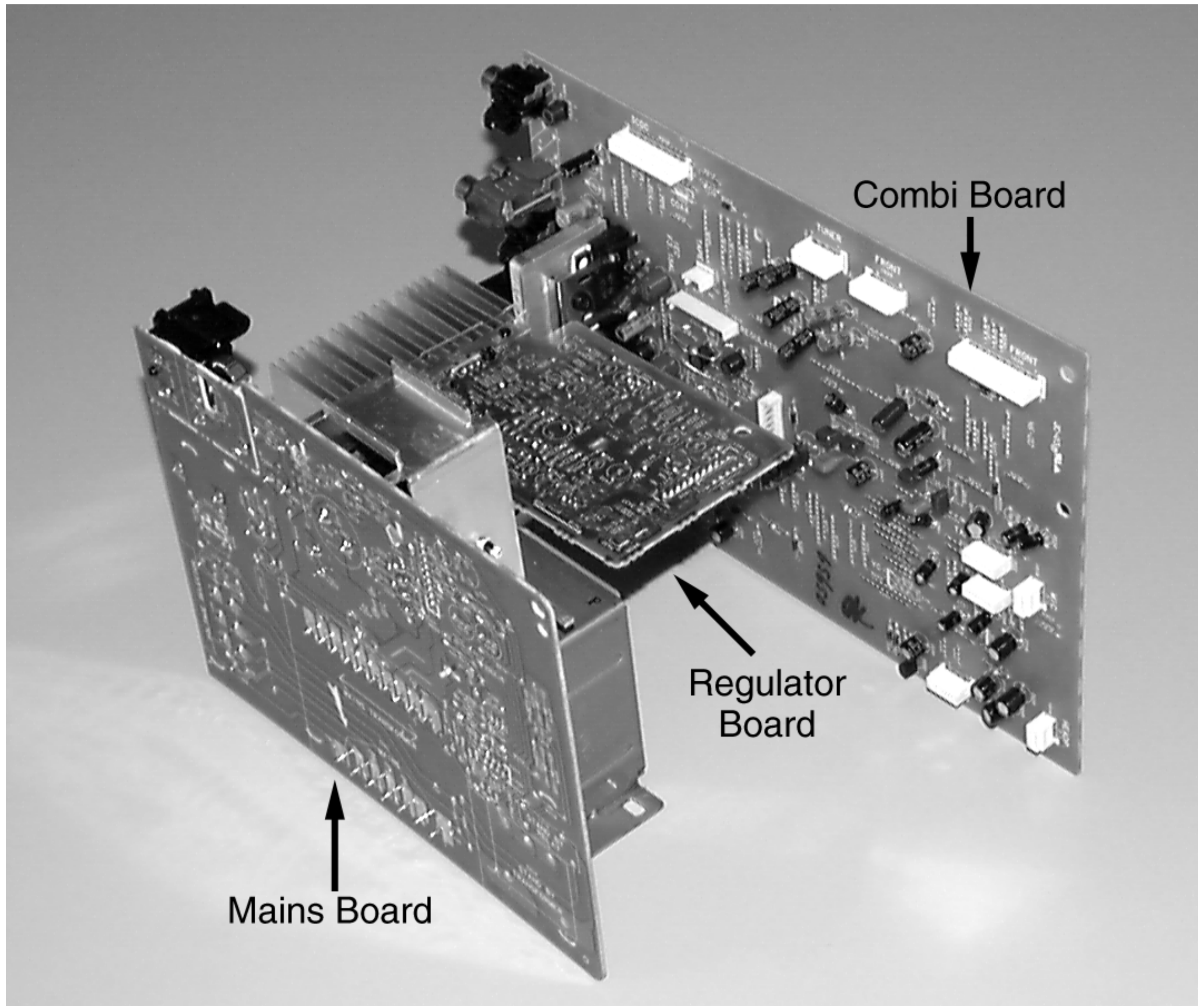
6801 ©	9322 129 34685	BZX284-C3V9
6804 ©	4822 130 11397	BAS316
6805 ©	4822 130 11397	BAS316
6806 ©	4822 130 11397	BAS316
6807 ©	4822 130 11397	BAS316
6808 ©	4822 130 11397	BAS316
6809 ©	4822 130 11397	BAS316
6810 ©	4822 130 11397	BAS316
6811 ©	9340 548 52115	BZX284-C5V1
6812 ©	9340 548 47115	PDZ3.3B

TRANSISTORS

7811 ©	5322 130 60159	BC846B

INTEGRATED CIRCUITS

7800 ©	9352 642 17557	SAA7325H/M2B CD10/M2
7801 ©	9352 622 36118	TZA1025T/V2 HF-Amplifier
7802	4822 209 32852	TDA7073A/N2
7803	4822 209 32852	TDA7073A/N2
7813	5322 209 11306	HEF4094BT
7814 ©	4822 209 17345	M62320FP, I2C SHIFT REGISTER
7815	4822 209 32852	TDA7073A/N2
7816 ©	4822 209 33165	TDA1308T/N1


Combi Board
Regulator Board
Mains Board

POWER 2001 Module

(40W Super G -Version)

stage .5

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Component Layout **componentside** 11-8
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Regulator Board
Component Layout **copperside** 11-10
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Component Layout **componentside** 11-12

Partslist..11-13

Circuit details:

Amplifier:

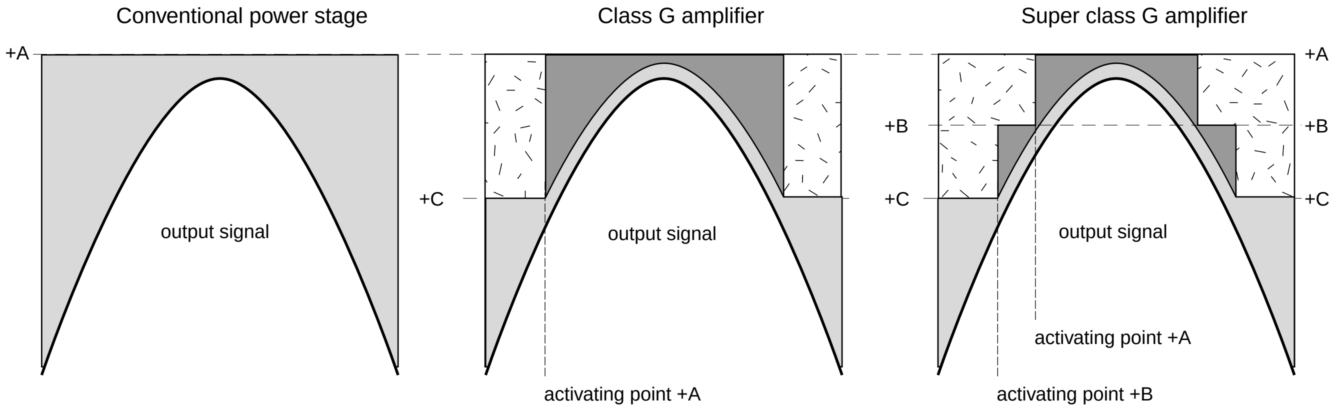
Attention: In the POWER 2001 module the power amplifier IC AN7591 is used as a bridge-amplifier.
Any connection from output to ground will destroy the outpout stages!

- Via the AMP_ON control line, connected to pins 6 (Stby), the power amplifiers are switched on/off by the µP.
  High level (approx. 4,5V): power amplifiers switched on
  Low level (approx. 0V): power amplifiers switched off

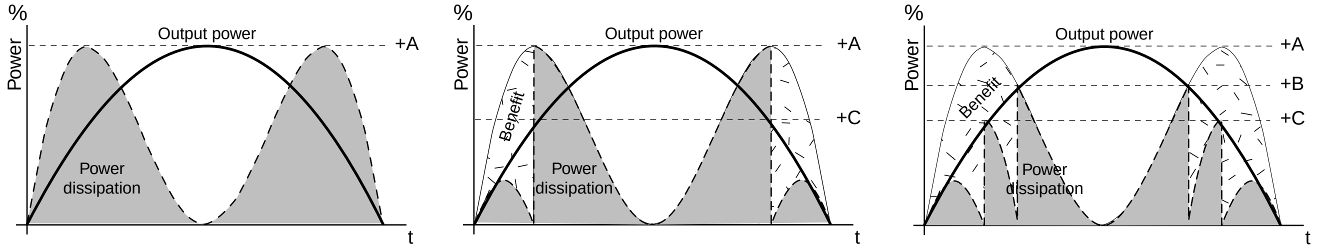
- Super class G - operation

  The power amplifiers operate as so-called super class G - amplifiers:
  The supply pins 12 (Vcc) are not just connected to one fixed DC-supply as in conventional amplifiers.
  Dependent on the output power there are three different DC-voltages supplied to the power amplifiers:
  ⇒ +C (+17V) for low output power
  ⇒ +B (+23V) for medium output power
  ⇒ +A (+35V) for high output power

Principle / benefit of Super Class G


Conventional power stage
Class G amplifier
Super class G amplifier
+A
+B
+C
output signal
activating point +A
activating point +B

░ Voltage drop on power stage IC
▓ Voltage drop on switching transistor(s)
▨ Benefit - voltage drop on switching transistor(s) reduces total power dissipation



Circuit details continued:

- **Low power standby feature**

An additional small standby transformer, reduces power consumption in standby-mode.
In case power is switched on, the control line LOW_PWR_CTR is high → relay 1210 is activated → contacts 1 and 2 are closed → transformer 5001is connected to mains.
When the set is switched off (standby) the control line LOW_PWR_CTR is low → transistor 7203 blocks → relay 1210 is not activated → mainstransformer is disconnected. Via standby transformer and rectifiers 6210-6214 the supply voltage LOW_PWR_SUP is substituted. This voltage is always available and so the microprocessor is kept running.

- **DC voltages +A1, +B1, +C1**

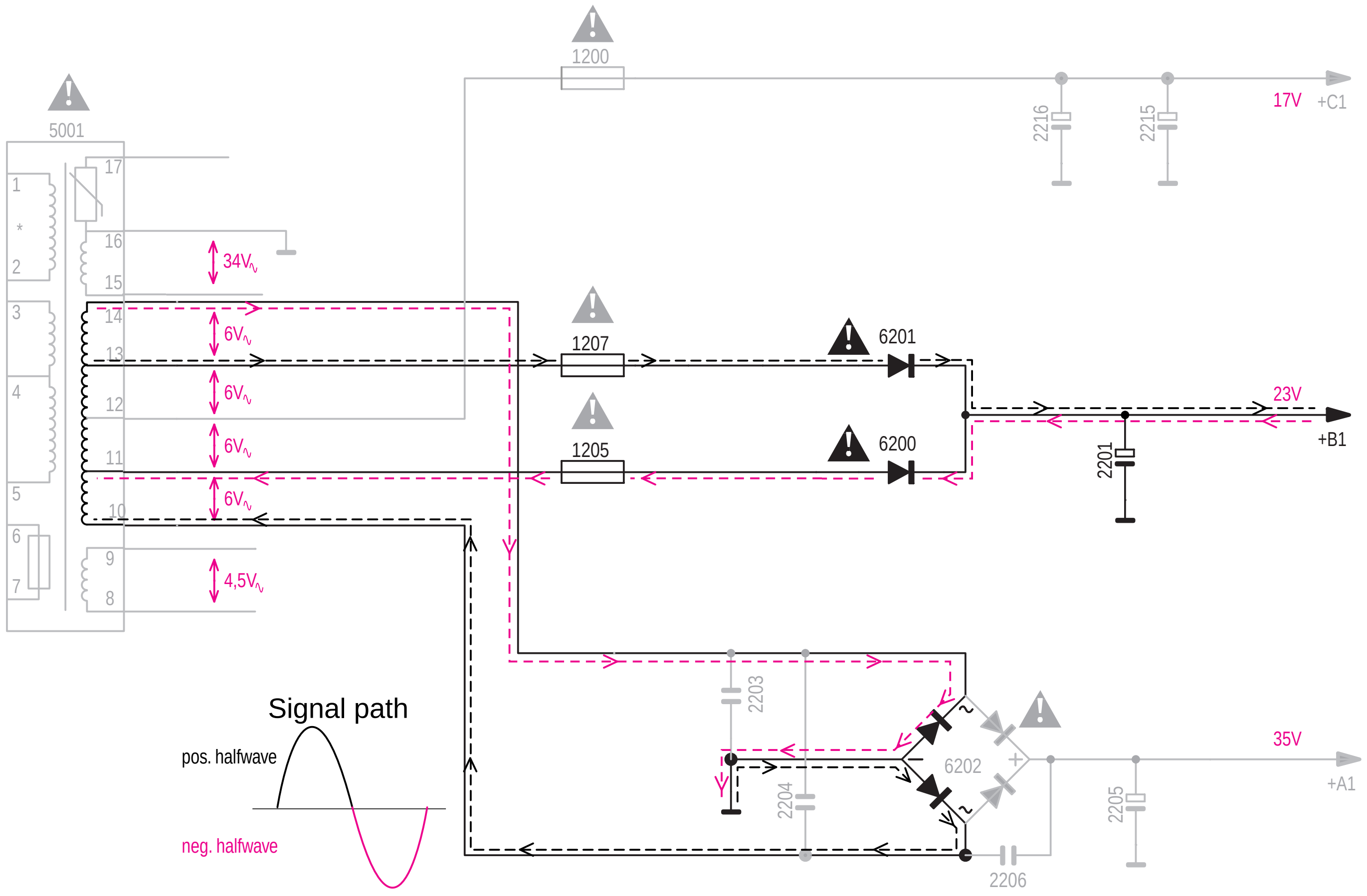
These voltages supply the Super Class G amplifier, described on previous page.
The whole power supply is optimized for the special characteristic of this type of amplifier. For that reason several “tricky” details have been applied to ensure optimal efficiency and symmetrical load to the mains transformer.

Generation of +A1

Common full wave rectifying with bridge rectifier 6202, using 100% secondary winding of mains transformer (pin 10-14).

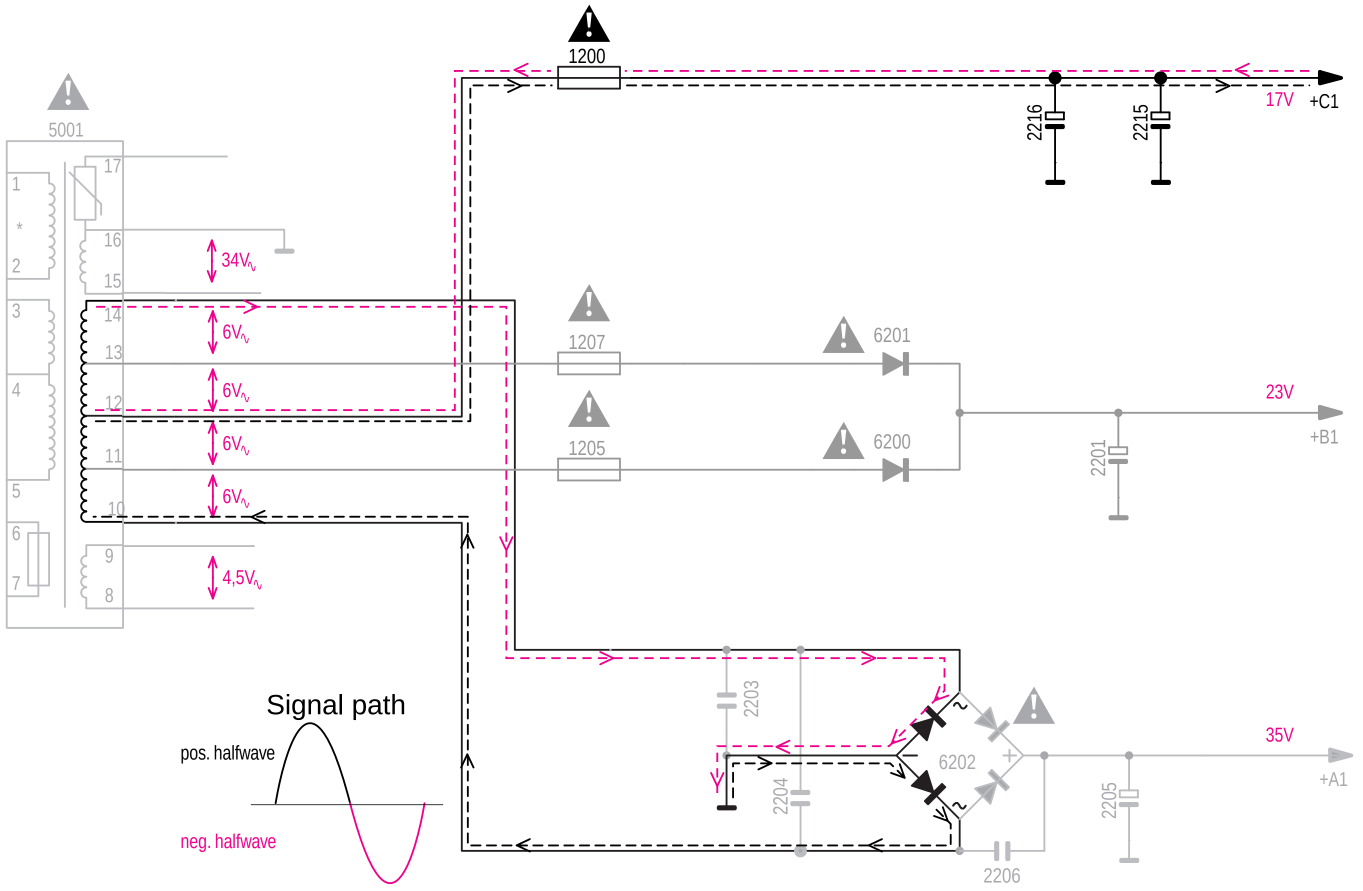
Generation of +B1

The supply for +B1 consists of one full wave rectifier:
– 2 diodes of bridge rectifier 6202, with 6200, 6201 for generation of +B1 using approx. 70% secondary winding of mains transformer (pin 10-13 respectively pin 11-14).
As example for generation of +B1 see picture 1.

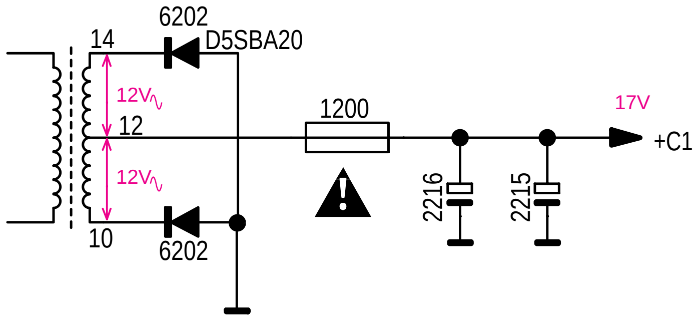

5001
1200
17V +C1
2216
2215
34V~
6V~
6V~
6V~
6V~
4,5V~
1207
6201
1205
6200
23V
+B1
2201
2203
2204
6202
2206
2205
35V
+A1
Signal path
pos. halfwave
neg. halfwave

picture 1

Generation of +C1
Full wave rectifying with 2 diodes of bridge rectifier 6202, using 50% secondary winding of mains transformer (pin 12-14/12-10).
See picture 2 below.

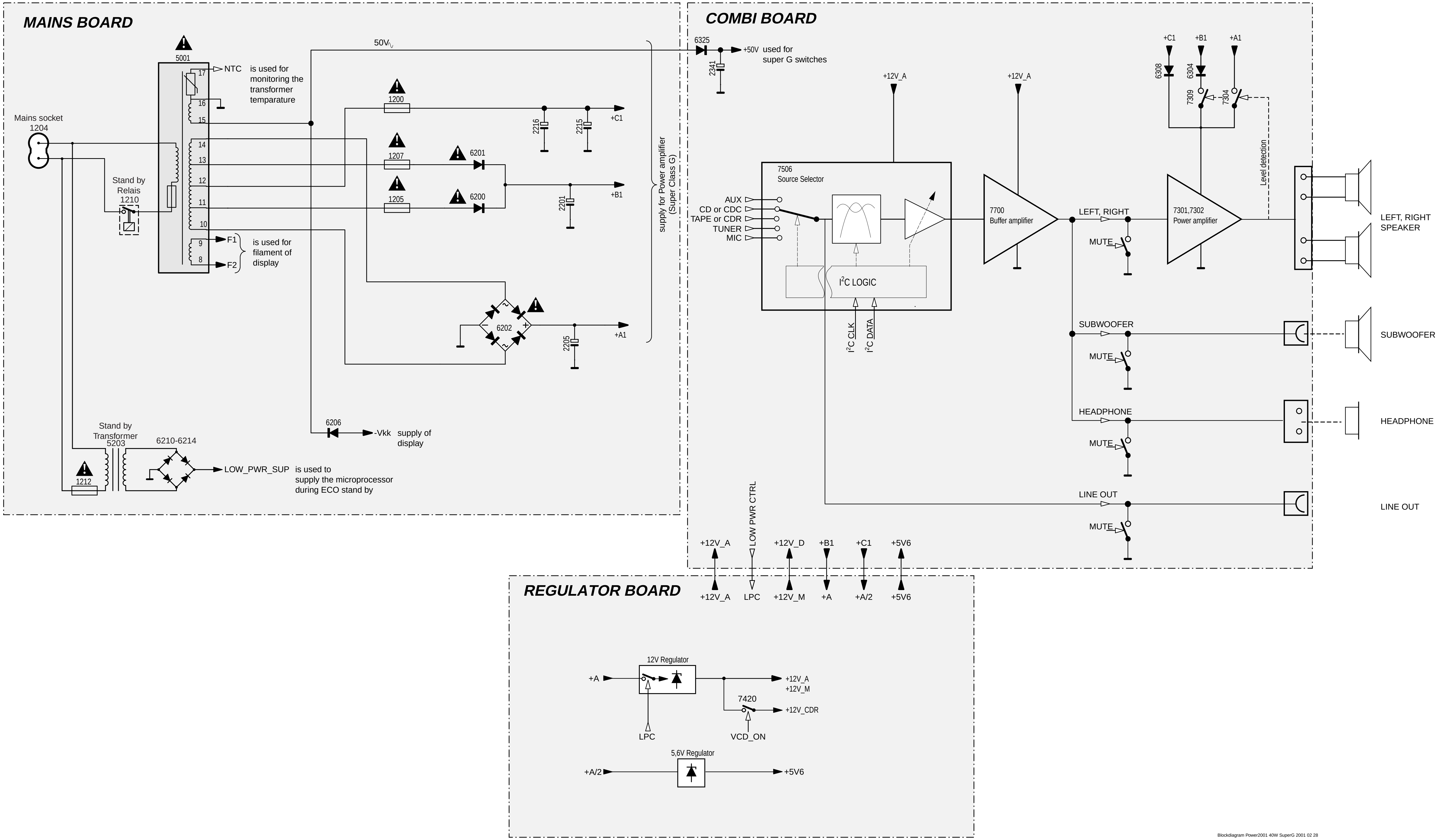

1200
5001
2216
2215
17V +C1
34V~
6V~
6V~
6V~
6V~
4,5V~
1207
6201
1205
6200
23V
+B1
2201
Signal path
pos. halfwave
neg. halfwave
2203
2204
6202
35V
+A1
2205
2206

simplified:

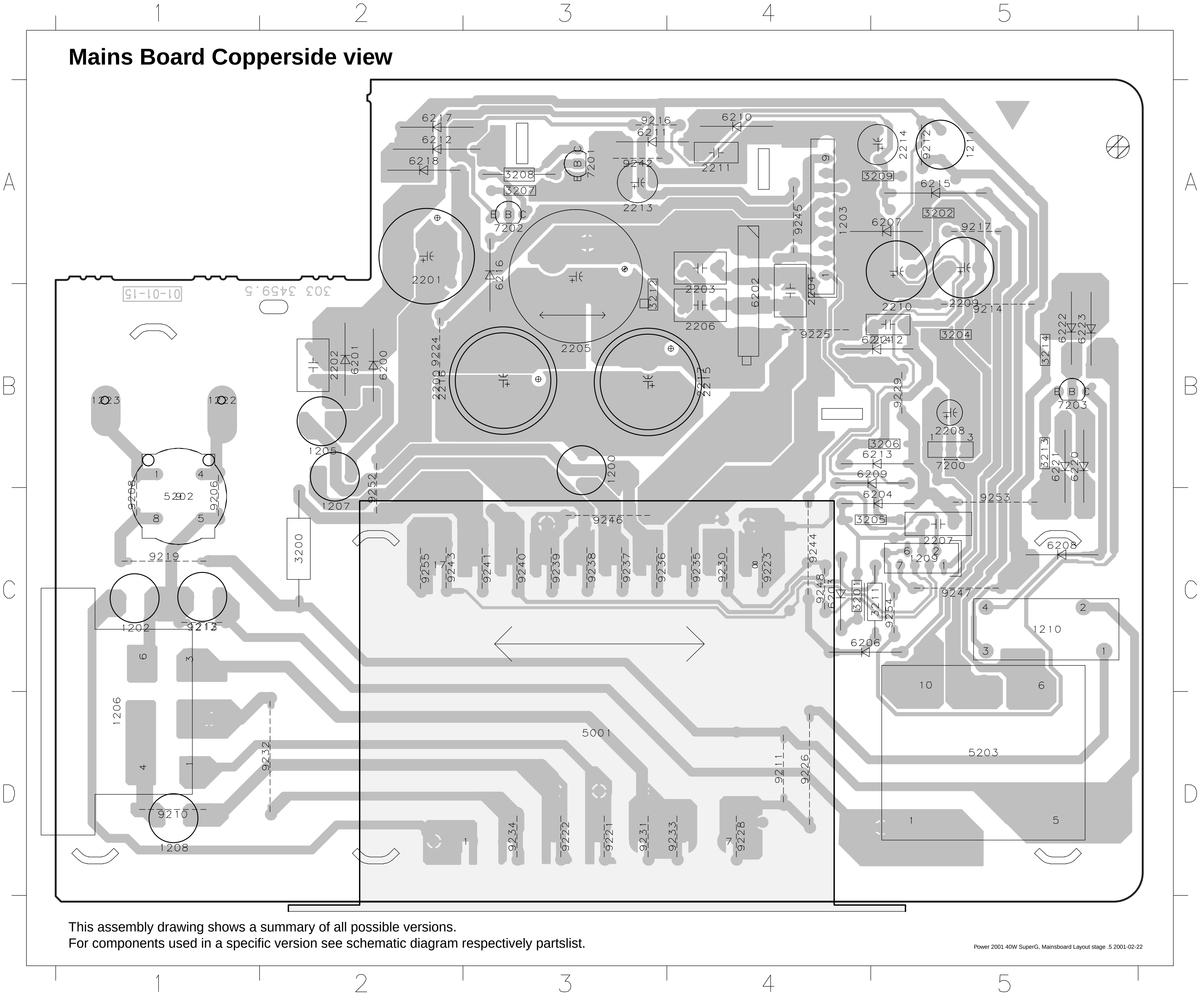

14
6202
D5SBA20
12V~
12
12V~
10
6202
1200
17V
+C1
2216
2215

picture 2

Blockdiagram Power 2001 40W Super-G


MAINS BOARD
COMBI BOARD
REGULATOR BOARD
50V
5001
NTC is used for monitoring the transformer temparature
Mains socket 1204
Stand by Relais 1210
17
16
15
14
13
12
11
10
9
8
F1
F2
is used for filament of display
1200
1207
1205
6201
6200
2216
2215
+C1
2201
+B1
6202
2205
+A1
supply for Power amplifier (Super Class G)
6206
-Vkk supply of display
Stand by Transformer 5203
6210-6214
1212
LOW_PWR_SUP is used to supply the microprocessor during ECO stand by
6325
2341
+50V used for super G switches
+12V_A
+12V_A
+C1
+B1
+A1
6308
6304
7309
7304
Level detection
AUX
CD or CDC
TAPE or CDR
TUNER
MIC
7506 Source Selector
I²C LOGIC
I²C CLK
I²C DATA
7700 Buffer amplifier
LEFT, RIGHT
MUTE
7301,7302 Power amplifier
LEFT, RIGHT SPEAKER
SUBWOOFER
MUTE
SUBWOOFER
HEADPHONE
MUTE
HEADPHONE
LINE OUT
MUTE
LINE OUT
+12V_A
LOW PWR CTRL
+12V_D
+B1
+C1
+5V6
+12V_A
LPC
+12V_M
+A
+A/2
+5V6
12V Regulator
+A
+12V_A
+12V_M
7420
+12V_CDR
LPC
VCD_ON
5,6V Regulator
+A/2
+5V6

Mains Board Copperside view

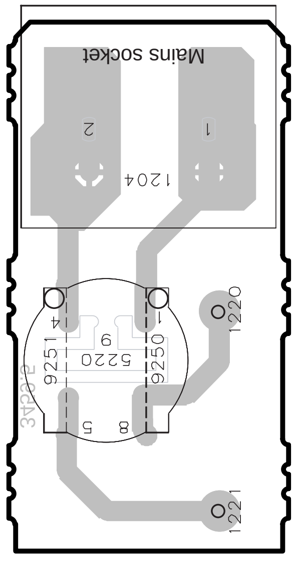

1
2
3
4
5
A
B
C
D
303 3459.5
01-01-15
6217
6212
6218
9216
6211
6210
2211
7201
3208
3207
7202
9242
2213
2201
6216
2205
2203
2206
3212
6202
2204
9245
1203
9225
3209
2214
9212
1211
6215
3202
6207
9217
2210
2209
9214
6214
6212
3204
6222
6223
3214
7203
2202
6201
6200
9224
2200
2216
2217
2215
1223
1222
5202
9208
9206
1205
1207
9252
1200
9229
2208
7200
3206
6213
6209
6204
9253
3205
2207
6208
3213
6221
6220
9246
3200
9219
9255
9243
9241
9240
9239
9238
9237
9236
9235
9230
9223
9244
9248
6203
3201
3211
9254
6206
1209
9247
1210
1202
9213
1206
5001
5203
9232
9211
9226
9210
1208
9234
9222
9221
9231
9233
9228

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

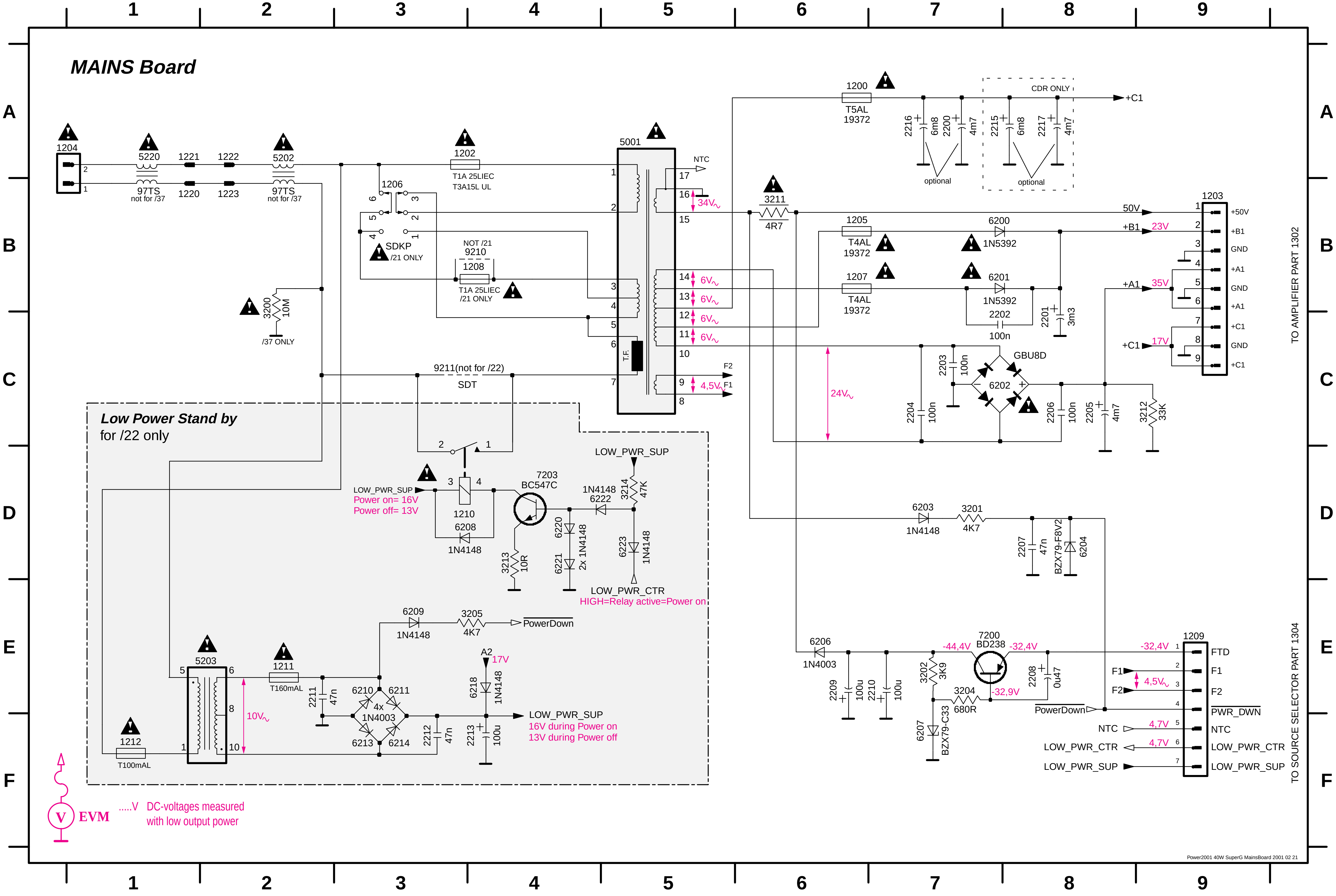
Power 2001 40W SuperG, Mainsboard Layout stage .5 2001-02-22

1200	B3	9217	A5
1202	C1	9219	C1
1203	A4	9221	D3
1205	B2	9222	D3
1206	D1	9223	C4
1207	C2	9224	B2
1208	D1	9225	B4
1209	C5	9226	D4
1210	C5	9228	D4
1211	A5	9229	B5
1212	C1	9230	C4
1222	B1	9231	D3
1223	B1	9232	D2
2200	B3	9233	D4
2201	A2	9234	D3
2202	B2	9235	C4
2203	A4	9236	C3
2204	B4	9237	C3
2205	A3	9238	C3
2206	B4	9239	C3
2207	C5	9240	C3
2208	B5	9241	C3
2209	A5	9242	A4
2210	B5	9243	C2
2211	A4	9244	C4
2212	B5	9245	A4
2213	A3	9246	C3
2214	A5	9247	C5
2215	B4	9248	C4
2216	B3	9252	B2
2217	B4	9253	C5
3200	C2	9254	C5
3201	C4	9255	C2
3202	A5		
3204	B5		
3205	C4		
3206	B5		
3207	A3		
3208	A3		
3209	A5		
3211	C5		
3212	B3		
3213	B5		
3214	B5		
5001	D3		
5202	B1		
5203	D5		
6200	B2		
6201	B2		
6202	A4		
6203	C4		
6204	C5		
6206	C4		
6207	A5		
6208	C5		
6209	B5		
6210	A4		
6211	A3		
6212	A2		
6213	B5		
6214	B5		
6215	A5		
6216	A3		
6217	A2		
6218	A2		
6220	B5		
6221	B5		
6222	B5		
6223	B5		
7200	B5		
7201	A3		
7202	A3		
7203	B5		
9206	C1		
9208	C1		
9210	D1		
9211	D4		
9212	A5		
9213	C1		
9214	B5		
9216	A3		

Mains Socket


Mains socket
1
2
1204
1220
9251
9250
5220
1221
3
4
5
8
9

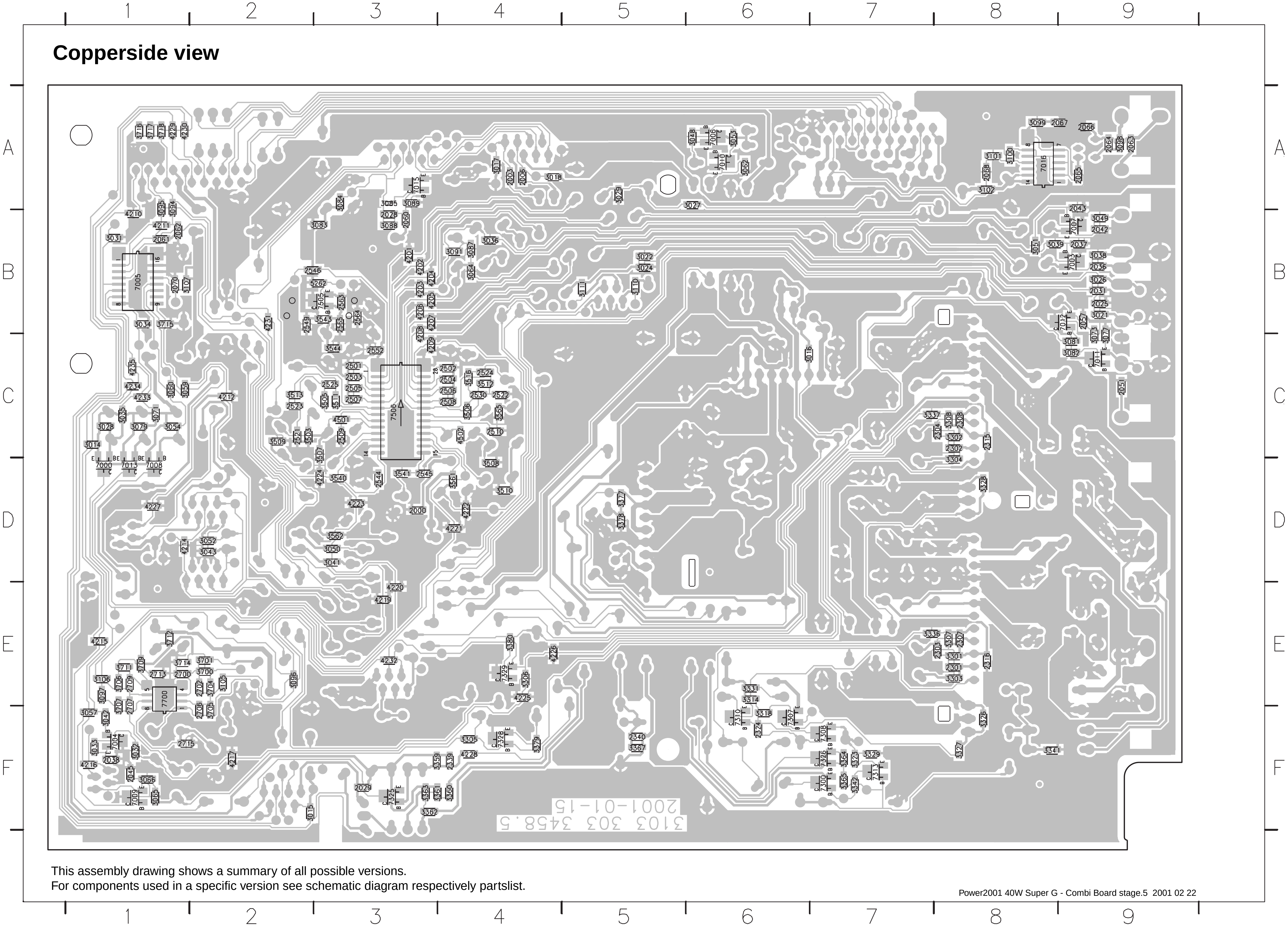
1200 A6	1208 B4	1223 B2	2205 D8	2211 E2	2217 A8	3206 E3	3213 D4	6201 B7	6208 D3	6214 E3	6221 D4	7203 D4	9213 E1
1202 A3	1209 E9	2200 A7	2206 D8	2212 E3	3200 C2	3207 E4	3214 C5	6202 C7	6209 E4	6215 F2	6222 C5	9206 A2	9214 E5
1203 B9	1210 D3	2201 C8	2207 D8	2213 E4	3201 D6	3208 F4	5001 C5	6203 D6	6210 E3	6216 F4	6223 D5	9208 B2	9242 E5
1205 B6	1211 E2	2202 C7	2208 E8	2214 F3	3202 E7	3209 F3	5202 A2	6204 D9	6211 E3	6217 F5	7200 D7	9210 B4	
1206 B3	1212 E1	2203 C7	2209 E6	2215 A7	3204 E7	3211 E6	5203 E1	6206 E6	6212 E5	6218 F5	7201 E4	9211 C3	
1207 B6	1222 A2	2204 D7	2210 E7	2216 A7	3205 E4	3212 D9	6200 B7	6207 E7	6213 E3	6220 D4	7202 F4	9212 D2	


1 2 3 4 5 6 7 8 9
A B C D E F
MAINS Board
1204
5220 97TS not for /37
1221 1222 1220 1223
5202 97TS not for /37
1202 T1A 25LIEC T3A15L UL
5001
NTC
17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
34V
6V 6V 6V 6V
4,5V F1 F2
T.F.
1206
SDKP /21 ONLY
NOT /21 9210
1208 T1A 25LIEC /21 ONLY
3200 10M /37 ONLY
9211(not for /22) SDT
1200 T5AL 19372
2216 6m8 2200 4m7
optional
CDR ONLY
2215 6m8 2217 4m7
+C1
3211 4R7
1205 T4AL 19372
6200 1N5392
1207 T4AL 19372
6201 1N5392
2202 100n
2201 3m3
50V +B1 23V +A1 35V +C1 17V
1203
+50V +B1 GND +A1 GND +A1 +C1 GND +C1
TO AMPLIFIER PART 1302
24V
2203 100n
GBU8D 6202
2204 100n
2206 100n
2205 4m7
3212 33K
Low Power Stand by
for /22 only
LOW_PWR_SUP
Power on= 16V
Power off= 13V
1210 6208 1N4148
7203 BC547C
1N4148 6222
3214 47K
6220 6221 2x 1N4148
6223 1N4148
3213 10R
LOW_PWR_CTR
HIGH=Relay active=Power on
6203 1N4148 3201 4K7
2207 47n BZX79-F8V2 6204
6209 1N4148 3205 4K7 PowerDown
5203
1211 T160mAL
2211 47n
6210 6211 4x 1N4003 6213 6214
10V
A2 17V
6218 1N4148
2212 47n 2213 100u
LOW_PWR_SUP
16V during Power on
13V during Power off
1212 T100mAL
6206 1N4003
2209 100u 2210 100u
3202 3K9
-44,4V 7200 BD238 -32,4V
-32,9V
3204 680R
6207 BZX79-C33
2208 0u47
-32,4V
1209
F1 4,5V F2
PowerDown
NTC 4,7V
LOW_PWR_CTR 4,7V
LOW_PWR_SUP
FTD F1 F2 PWR_DWN NTC LOW_PWR_CTR LOW_PWR_SUP
TO SOURCE SELECTOR PART 1304
V EVM
.....V DC-voltages measured with low output power
Power2001 40W SuperG MainsBoard 2001 02 21

COMBI BOARD

2000	D3
2003	A4
2006	A4
2025	B9
2028	B3
2029	F3
2031	B9
2036	B9
2037	B9
2038	F1
2042	B9
2043	A9
2045	F1
2051	C9
2057	B9
2060	B3
2061	B1
2062	B1
2063	A9
2064	A9
2065	A9
2066	A9
2067	A9
2068	A8
2070	B1
2301	E8
2302	C8
2303	E8
2304	C8
2307	E8
2308	C8
2315	C8
2316	E8
2324	F6
2339	F4
2340	F5
2501	C3
2502	C4
2503	C3
2504	C4
2505	C3
2506	C4
2507	C3
2508	C4
2509	C3
2510	C4
2521	C2
2522	C4
2523	C2
2524	C4
2525	C3
2530	C4
2544	D3
2545	D3
2546	B2
2549	B2
2552	C3
2563	B3
2564	B3
2565	B3
2700	E1
2702	E2
2706	F2
2707	F1
2709	E1
2713	E1
2715	F1
3014	C1
3015	F2
3016	C6
3017	A4
3018	A4
3021	B9
3022	B5
3024	B5
3026	B9
3027	A6
3028	C1
3029	A5
3031	B1
3032	F1
3033	F1
3034	B1
3035	C1
3036	B4
3038	B9
3039	B8
3041	D3
3042	F1
3043	D2
3048	A6
3049	B9
3050	D3
3051	B8
3052	D2
3053	A6
3054	C1
3057	F1
3059	C1
3060	C1
3062	A6
3064	B4
3065	F1
3066	F1
3071	C1
3073	C9
3077	C9
3079	C1
3081	C9
3082	C9
3083	B3
3084	A3
3085	A3
3087	B4
3088	B3
3089	A3
3091	B4
3094	A1
3095	A1
3096	E2
3097	E1
3098	A9
3099	A8
3100	A8
3101	A8
3102	A8
3105	E2
3106	E1
3107	B1
3110	B5
3111	B5
3301	E8
3302	C8
3303	E8
3304	D8
3305	F4
3306	E4
3307	E8
3308	C8
3314	E6
3318	F6
3323	F7
3326	F8
3327	F8
3328	D8
3329	F7
3331	E6
3336	E7
3337	C7
3341	F8
3342	F7
3359	F3
3360	F4
3361	F3
3362	F3
3363	F3
3364	F7
3365	F7
3367	F5
3377	D5
3378	D5
3379	F4
3380	E4
3503	C2
3505	C3
3506	C4
3507	C3
3508	D4
3509	C2
3510	D4
3511	C3
3512	C4
3513	C2
3516	C4
3540	D3
3541	D3
3543	B3
3544	C3
3561	D4
3562	D3
3565	C4
3700	E2
3701	E2
3704	E2
3705	F2
3706	E1
3707	F1
3709	E1
3711	E1
3712	E1
3714	E1
3715	B1
3716	A1
3717	A1
3718	A1
4201	B3
4202	B3
4203	B3
4204	B3
4205	B3
4206	B3
4207	B3
4208	C3
4209	C3
4210	B1
4211	B1
4212	C2
4214	D1
4215	E1
4216	F1
4217	F2
4219	E3
4220	E3
4221	D4
4222	D4
4223	D3
4224	D3
4225	E4
4226	E4
4227	D1
4228	F4
4229	A1
4230	A1
4231	B2
4232	E3
4233	C1
4234	C1
4235	C1
4501	C3
4502	C4
5262	B3
7000	D1
7003	B9
7004	F1
7005	B1
7006	A6
7007	B9
7008	D1
7009	F1
7010	A6
7011	C9
7012	B9
7013	D1
7015	A3
7016	A8
7300	F7
7307	F6
7308	F7
7310	F6
7313	F7
7325	F3
7326	F7
7328	F4
7329	E4
7505	B3
7506	C3
7700	E1

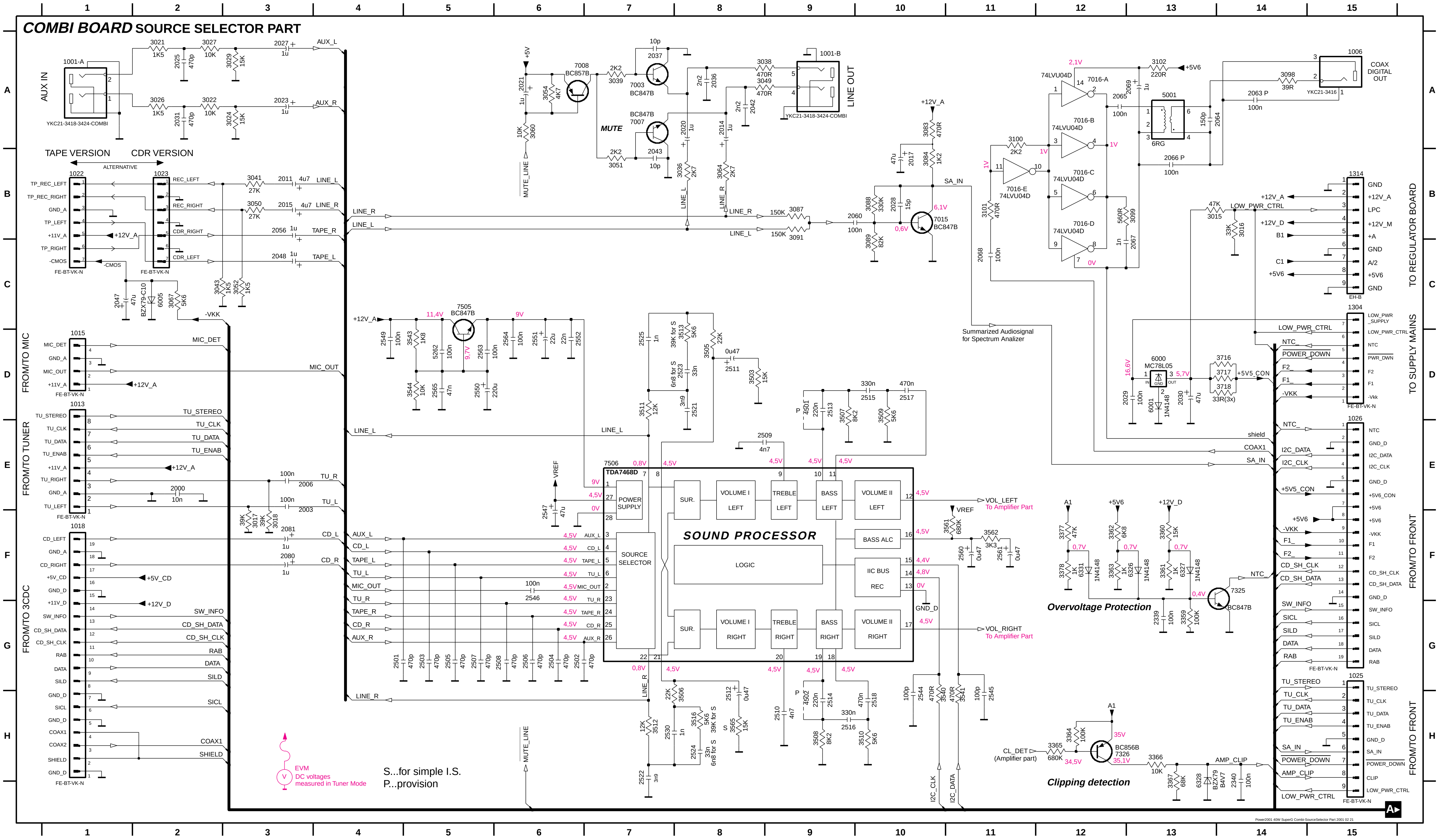
Copperside view



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

1001-A	A1
1001-B	A9
1002	A15
1006	A15
1013	D1
1015	D1
1018	F1
1020	H13
1022	B1
1023	B2
1025	G15
1026	E15
1304	C15
1314	B15
1316	A4
2000	E2
2003	E3
2006	E3
2011	B3
2014	A8
2015	B3
2017	B9
2020	A8
2021	A6
2023	A3
2025	A2
2027	A3
2028	B10
2029	D13
2030	D13
2031	A2
2036	A8
2037	A7
2042	A8
2043	B7
2047	C1
2048	C3
2056	B3
2060	B9
2063	A14
2064	A13
2065	A12
2066	B13
2067	C13
2068	C11
2069	A13
2080	F3
2081	F3
2339	G13
2340	H14
2501	G4
2502	G6
2503	G5
2504	G6
2505	G5
2506	G6
2507	G5
2508	G6
2509	E8
2510	H9
2511	D8
2512	H8
2513	D9
2514	H9
2515	D10
2516	H9
2517	D10
2518	H10
2521	D8
2522	H7
2523	D8
2524	H8
2525	D7
2530	H7
2544	H10
2545	H11
2546	F6
2547	E6
2549	D4
2550	D5
2551	D6
2552	D6
2560	D11
2561	D11
2563	D5
2564	D6
2565	D5
3015	D14
3016	D14
3017	E3
3018	E3
3021	A2
3022	A3
3024	A3
3026	A2
3027	A3
3029	A3
3036	B8
3038	A8
3039	A7
3041	B3
3043	A2
3049	A8
3050	B3
3051	B7
3052	B3
3054	A6
3060	A6
3064	B8
3067	C2
3083	B9
3084	B9
3085	B10
3087	B9
3088	B10
3089	C10
3091	C9
3098	A14
3099	B13
3100	A11
3101	B11
3102	A13
3110	A3
3111	A3
3359	G13
3360	F13
3361	G13
3362	F13
3363	G12
3364	H12
3365	H12
3366	H13
3367	H13
3377	G12
3378	G12
3503	D8
3505	D8
3506	H8
3507	D9
3508	H9
3509	D10
3510	H10
3511	D7
3512	H7
3513	D8
3516	H8
3540	H10
3541	H11
3543	D5
3544	D5
3561	D10
3562	D11
3565	H8
3716	D14
3717	E14
3718	E14
4501	D9
4502	H9
5001	A13
5262	D5
6000	D13
6001	D13
6005	C2
6326	G13
6327	G13
6328	H13
6331	G12
7003	A7
7007	A7
7008	A6
7015	B10
7016-A	A12
7016-B	A12
7016-C	B12
7016-D	B12
7016-E	B11
7016-F	A11
7325	G14
7326	H12
7505	C5
7506	E7

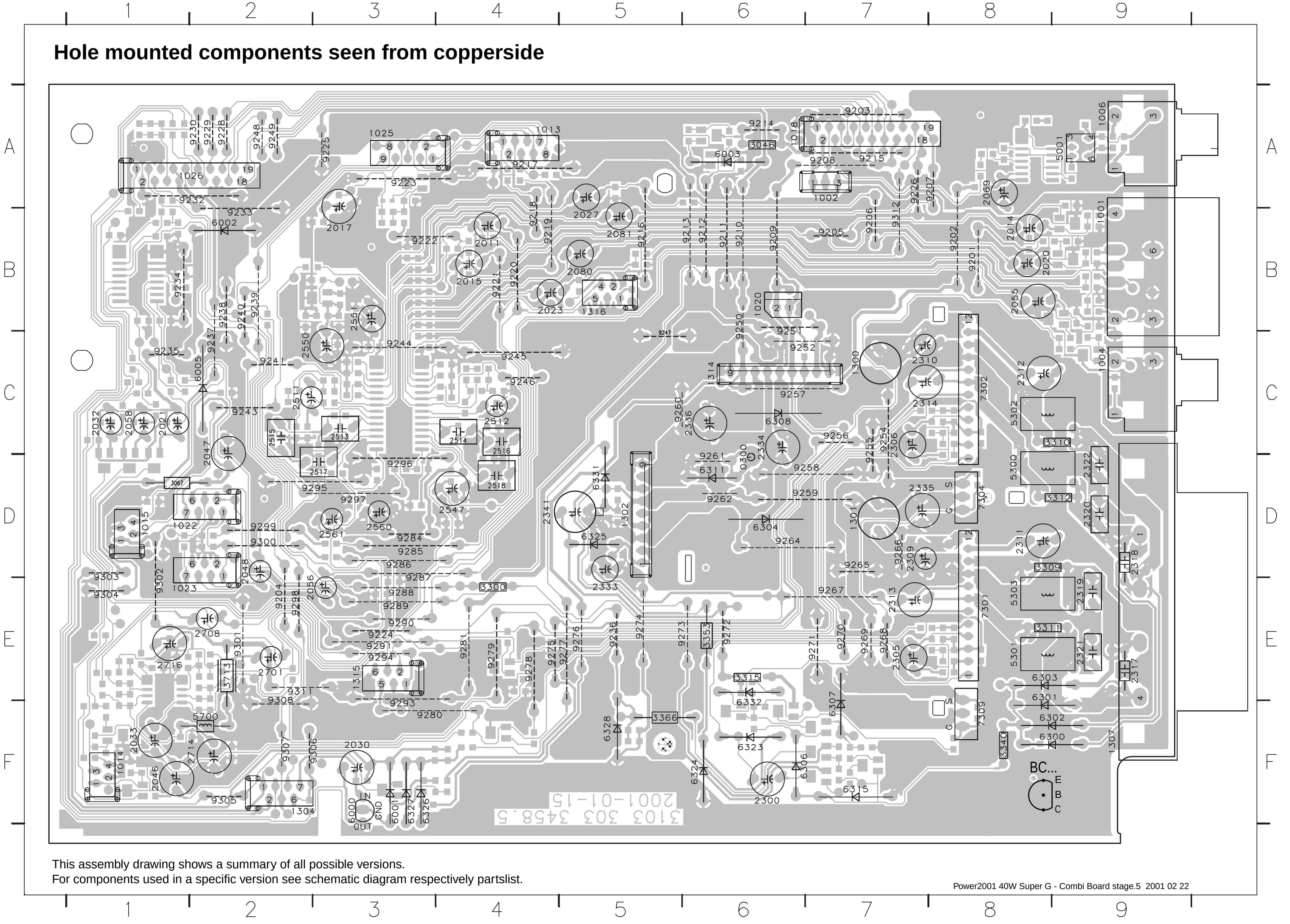
COMBI BOARD SOURCE SELECTOR PART


AUX IN
YKC21-3418-3424-COMBI
TAPE VERSION
CDR VERSION
ALTERNATIVE
LINE OUT
MUTE
COAX DIGITAL OUT
TO REGULATOR BOARD
TO SUPPLY MAINS
FROM/TO MIC
FROM/TO TUNER
FROM/TO 3CDC
FROM/TO FRONT
TDA7468D
SOUND PROCESSOR
POWER SUPPLY
SOURCE SELECTOR
SUR.
VOLUME I LEFT
TREBLE LEFT
BASS LEFT
VOLUME II LEFT
BASS ALC
LOGIC
IIC BUS REC
VOLUME I RIGHT
TREBLE RIGHT
BASS RIGHT
VOLUME II RIGHT
VOL_LEFT To Amplifier Part
VOL_RIGHT To Amplifier Part
Summarized Audiosignal for Spectrum Analizer
Overvoltage Protection
Clipping detection
CL_DET (Amplifier part)
MC78L05
EVM DC voltages measured in Tuner Mode
S...for simple I.S.
P...provision
Power2001 40W SuperG Combi-SourceSelector Part 2001 02 21

COMBI BOARD

0300	D6
1001	B9
1002	A7
1004	C9
1006	A9
1013	A4
1014	F1
1015	D1
1018	A6
1020	B6
1022	D1
1023	E1
1025	A3
1026	A2
1300	C7
1301	D7
1302	D5
1304	F2
1307	F9
1314	C6
1315	E3
1316	B5
2011	B4
2014	B8
2015	B4
2017	B3
2020	B8
2021	C1
2023	B4
2027	B5
2030	F3
2032	C1
2033	F1
2046	F1
2047	C2
2048	D2
2055	B8
2056	E2
2058	C1
2069	A8
2080	B5
2081	B5
2300	F6
2305	E7
2306	C7
2309	D7
2310	C7
2311	D8
2312	C8
2313	E7
2314	C7
2317	E9
2318	D9
2319	E9
2320	D9
2321	E9
2322	D9
2333	E5
2334	C6
2335	D7
2336	C6
2341	D4
2511	C2
2512	C4
2513	C3
2514	C4
2515	C2
2516	C4
2517	D3
2518	D4
2547	D4
2550	C2
2551	B3
2560	D3
2561	D3
2701	E2
2708	E2
2714	F2
2716	E1
3046	A6
3067	D1
3300	E4
3309	D8
3310	C9
3311	E8
3312	D9
3315	E6
3340	F8
3353	E6
3366	F5
3713	E2
5001	A9
5300	D8
5301	E8
5302	C8
5303	E8
5700	F2
6000	F3
6001	F3
6002	B2
6003	A6
6005	C2
6300	F9
6301	E8
6302	F9
6303	E8
6304	D6
6306	F6
6307	F7
6308	C6
6311	D6
6315	F7
6323	F6
6324	F6
6325	D5
6326	F3
6327	F3
6328	F5
6331	D5
6332	F6
7301	E8
7302	C8
7304	D8
7309	F8
9201	B8
9202	B8
9203	A7
9204	E2
9205	B7
9206	B7
9207	A8
9208	A7
9209	B6
9210	B6
9211	B6
9212	B6
9213	B6
9214	A6
9215	A7
9216	B5
9217	A4
9218	B4
9219	B4
9220	B4
9221	B4
9222	B3
9223	A3
9224	E3
9225	A3
9226	A7
9228	A2
9229	A2
9230	A2
9232	A2
9233	B2
9234	B1
9235	C1
9236	E5
9237	C2
9238	B2
9239	B2
9240	B2
9241	C2
9243	C2
9244	C3
9245	C4
9246	C4
9247	C5
9248	A2
9249	A2
9250	B6
9251	C6
9252	C6
9254	C7
9255	C7
9256	C7
9257	C6
9258	D7
9259	D6
9260	C5
9261	D6
9262	D6
9264	D6
9265	D7
9266	D7
9267	E7
9268	E7
9269	E7
9270	E7
9271	E7
9272	E6
9273	E5
9274	E5
9275	E4
9276	E5
9277	E5
9278	E4
9279	E4
9280	F3
9281	E4
9284	D3
9285	D3
9286	D3
9287	E3
9288	E3
9289	E3
9290	E3
9291	E3
9293	F3
9294	E3
9295	D3
9296	D3
9297	D3
9298	E2
9299	D2
9300	D2
9301	E2
9302	E1
9303	D1
9304	E1
9305	F2
9306	F3
9307	F2
9308	E2
9311	E2
9312	B7

Hole mounted components seen from copperside



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

Power2001 40W Super G - Combi Board stage.5 2001 02 22

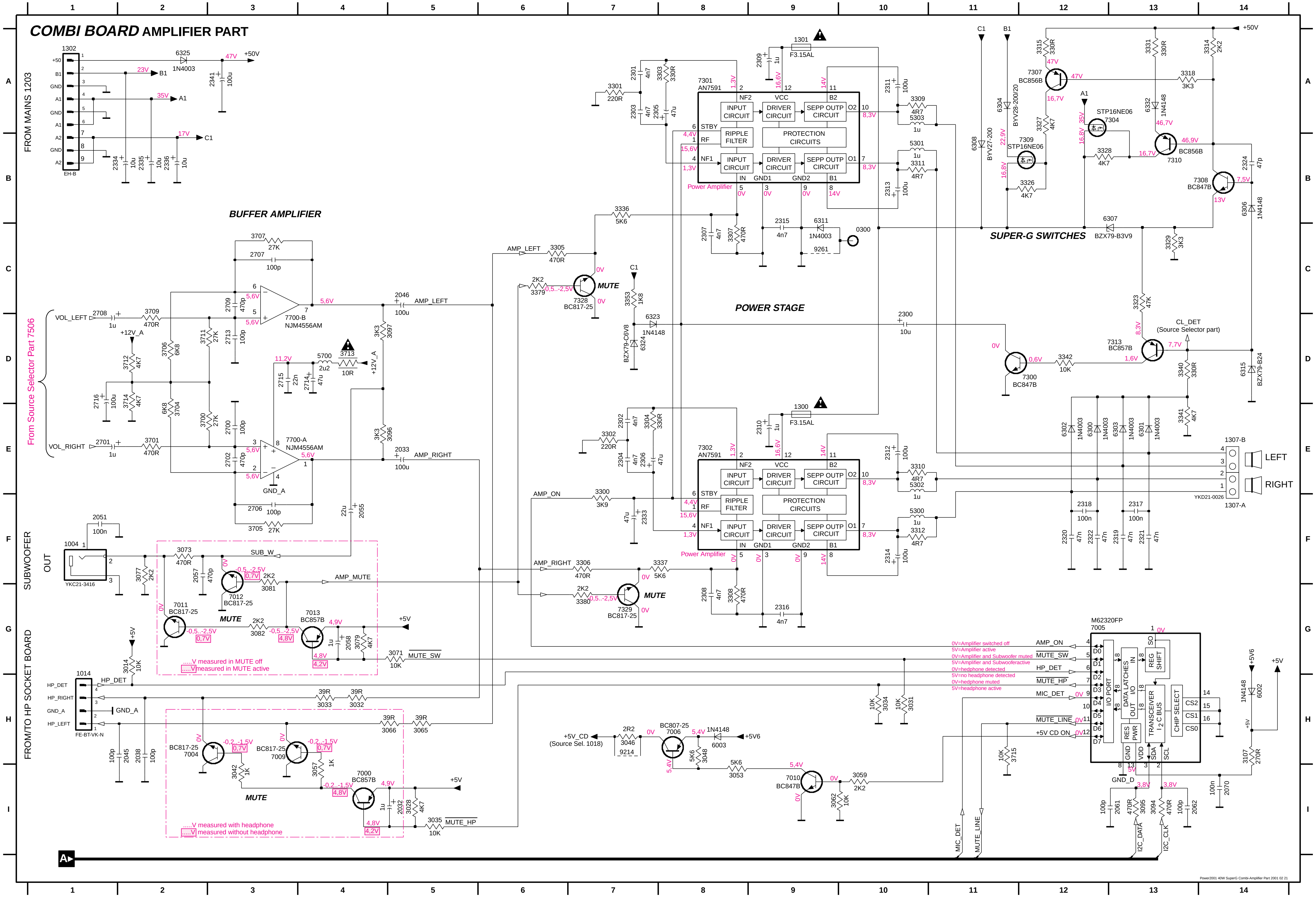
0300	C10	2033	E5	2070	I14	2309	A9	2319	F13
1004	F1	2038	H2	2300	D9	2310	E9	2320	F12
1014	G1	2045	H2	2301	A7	2311	A10	2321	F13
1300	E9	2046	C5	2302	E7	2312	E10	2322	F12
1301	A9	2051	F1	2303	A7	2313	B10	2324	B14
1302	A1	2055	F4	2304	E7	2314	F10	2333	F7
1307-A	F14	2057	F2	2305	A7	2315	B9	2334	B1
1307-B	E14	2058	G4	2306	E7	2316	G9	2335	B2
1315	B1	2061	I13	2307	C8	2317	F13	2336	B2
2032	I5	2062	I13	2308	G8	2318	F12	2340	C14

2341	A3	2715	D4	3046	H7	3077	F2	3107	H14
2700	E3	2716	D1	3048	I8	3079	G4	3300	F7
2701	E1	3014	G2	3053	I8	3081	G3	3301	A7
2702	E3	3028	I5	3057	H4	3082	G3	3302	E7
2706	F3	3031	H10	3059	I10	3094	I13	3303	A8
2707	C3	3032	H4	3062	I9	3095	I13	3304	E7
2708	D1	3033	H4	3065	H5	3096	E4	3305	C6
2709	C3	3034	H10	3066	H5	3097	D4	3306	F7
2713	D3	3035	I5	3071	G4	3105	C2	3307	C8
2714	E3	3042	H3	3073	F2	3106	C2	3308	G8

3309	A10	3328	B12	3365	D12	3707	C3	5303	A10
3310	E10	3329	C13	3366	C13	3709	D2	5700	D3
3311	B10	3331	A13	3367	C14	3711	D2	6002	H14
3312	F10	3336	B7	3379	C6	3712	D2	6003	H8
3314	A14	3337	F8	3380	G7	3713	D4	6300	E12
3315	A12	3340	D13	3700	E2	3714	D2	6301	E13
3318	A13	3341	E13	3701	E2	3715	H11	6302	E12
3323	C13	3342	D12	3704	E2	5300	F10	6303	E13
3326	B12	3353	C7	3705	F3	5301	B10	6304	A11
3327	A12	3364	C12	3706	D2	5302	E10	6306	B14

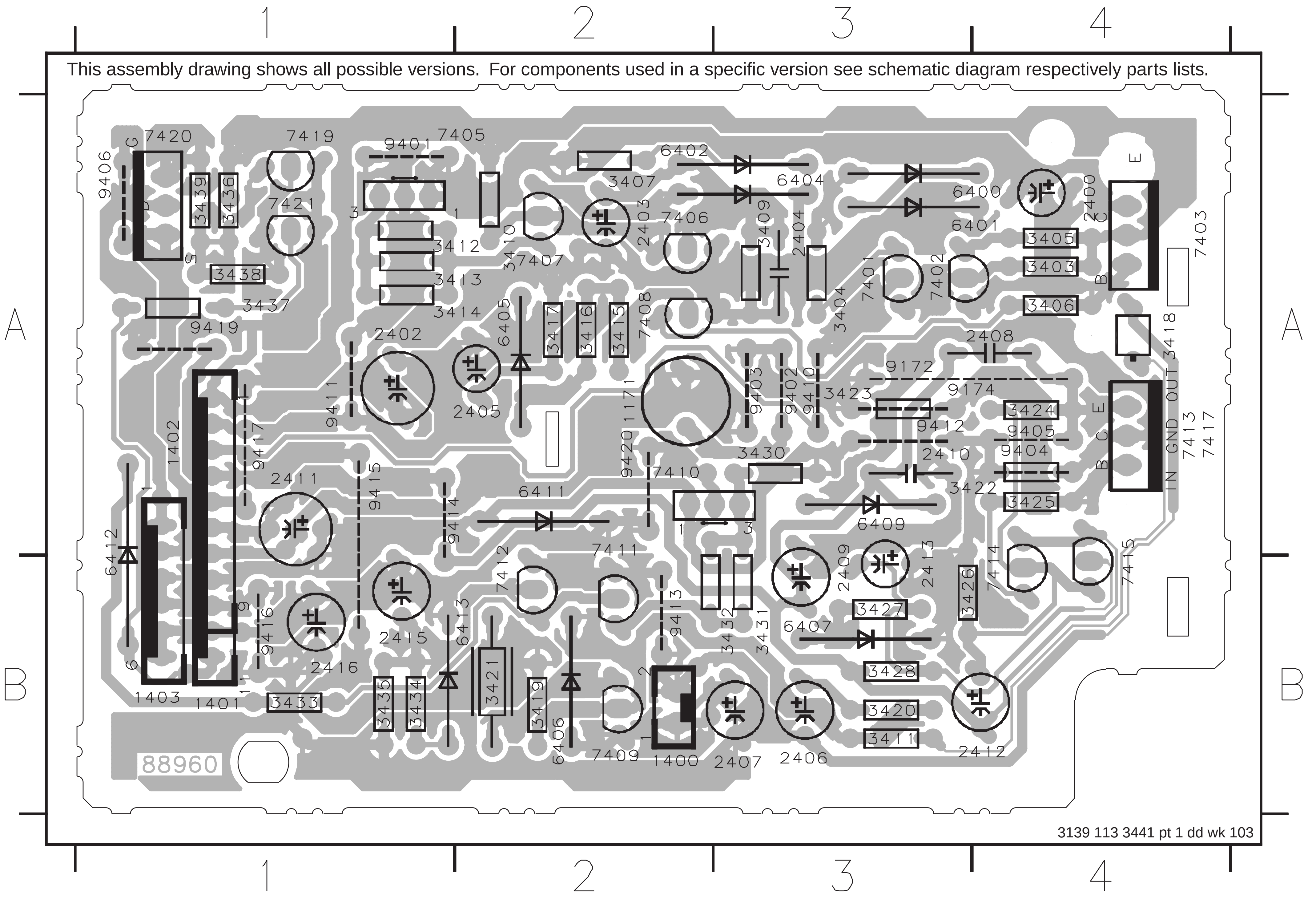
6307	B13	7004	H2	7302	E8	7700-A	E3
6308	B11	7005	G12	7304	A13	7700-B	D3
6311	B9	7006	I8	7307	A12	9214	I7
6315	D14	7009	H3	7308	B14	9261	C9
6323	D7	7010	I9	7309	B12		
6324	D7	7011	G2	7310	B13		
6325	A2	7012	G3	7313	D13		
6328	C13	7013	G4	7326	C12		
6332	A13	7300	D11	7328	C6		
7000	H4	7301	A8	7329	G7		

COMBI BOARD AMPLIFIER PART


1 2 3 4 5 6 7 8 9 10 11 12 13 14
A B C D E F G H I
FROM MAINS 1203
1302
EH-B
+50 B1 GND A1 GND A1 A2 GND A2
6325 1N4003
47V +50V
23V B1
35V A1
17V C1
2341 100u
2334 10u 2335 10u 2336 10u
BUFFER AMPLIFIER
From Source Selector Part 7506
VOL_LEFT 2708 1u 3709 470R
VOL_RIGHT 2701 1u 3701 470R
+12V_A
3712 4K7 3714 4K7 2716 100u
3706 6K8 3704 6K8 3711 27K 3700 27K
2709 470p 2713 100p 2700 100p 2702 470p
3707 27K 2707 100p 2706 100p 3705 27K
7700-B NJM4556AM
7700-A NJM4556AM
5,6V
GND_A
2046 100u AMP_LEFT
2033 100u AMP_RIGHT
3097 3K3 3096 3K3
+12V_A 3713 10R 5700 2u2 2715 22n 2714 47u 11,2V
22u 2055
SUBWOOFER OUT
1004 YKC21-3416
2051 100n
3073 470R 3077 2K2 2057 470p
SUB_W
7012 BC817-25
7011 BC817-25
7013 BC857B
3081 2K2 3082 2K2
AMP_MUTE
MUTE
-0,5..-2,5V 0,7V 4,8V 4,9V 4,2V
+5V
2058 1u 3079 4K7
3071 10K MUTE_SW
.....V measured in MUTE off
.....V measured in MUTE active
FROM/TO HP SOCKET BOARD
1014 FE-BT-VK-N
HP_DET HP_RIGHT GND_A HP_LEFT
3014 10K +5V
GND_A
2045 100p 2038 100p
3033 39R 3032 39R 3066 39R 3065 39R
7004 BC817-25
7009 BC817-25
7000 BC857B
3042 1K 3057 1K
-0,2..-1,5V 0,7V
2032 1u 3028 4K7
3035 10K MUTE_HP
.....V measured with headphone
.....V measured without headphone
AMP_LEFT 3305 470R
3336 5K6
2K2 3379
7328 BC817-25 MUTE
0,5..-2,5V 0V
C1 3353 1K8
6323 1N4148
6324 BZX79-C6V8
POWER STAGE
AMP_ON 3300 3K9
47u 2333
AMP_RIGHT 3306 470R
3337 5K6
2K2 3380
7329 BC817-25 MUTE
1301 F3.15AL
1300 F3.15AL
3301 220R 3302 220R
2301 4n7 2303 4n7 2305 47u 3303 330R
2302 4n7 2304 4n7 2306 47u 3304 330R
2309 1u 2310 1u
7301 AN7591
7302 AN7591
NF2 VCC B2
INPUT CIRCUIT
DRIVER CIRCUIT
SEPP OUTP CIRCUIT
RIPPLE FILTER
PROTECTION CIRCUITS
STBY RF NF1
IN GND1 GND2 B1
O2 O1
Power Amplifier
1,3V 16,6V 14V 4,4V 15,6V 8,3V 0V
2311 100u 2312 100u 2313 100u 2314 100u
3309 4R7 5303 1u
5301 1u 3311 4R7
3310 4R7 5302 1u
5300 1u 3312 4R7
2307 4n7 3307 470R
2308 4n7 3308 470R
2315 4n7 2316 4n7
6311 1N4003
9261 0300
2300 10u
0V 0,6V
7300 BC847B
3342 10K
1,6V
7313 BC857B
CL_DET (Source Selector part)
7,7V 8,3V
3323 47K
3340 330R
3341 4K7
6315 BZX79-B24
SUPER-G SWITCHES
6307 BZX79-B3V9
3329 3K3
6306 1N4148
C1 B1 +50V
3315 330R 3331 330R 3314 2K2
7307 BC856B
47V 16,7V
3318 3K3
6304 BYV28-200/20
6308 BYV27-200
22,9V
3327 4K7
7309 STP16NE06
7304 STP16NE06
A1 35V 16,8V
3328 4K7
3326 4K7
6332 1N4148
46,7V 46,9V 16,7V
7310 BC856B
7308 BC847B
7,5V 13V
2324 47p
6302 1N4003 6300 1N4003 6303 1N4003 6301 1N4003
1307-B 1307-A YKD21-0026
LEFT RIGHT
2318 100n 2317 100n
2320 47n 2322 47n 2319 47n 2321 47n
M62320FP 7005
AMP_ON
MUTE_SW
HP_DET
MUTE_HP
MIC_DET
MUTE_LINE
+5V CD ON
0V=Amplifier switched off
5V=Amplifier active
0V=Amplifier and Subwoofer muted
5V=Amplifier and Subwooferactive
0V=hedphone detected
5V=no headphone detected
0V=hedphone muted
5V=headphone active
D0 D1 D2 D3 D4 D5 D6 D7
I/O PORT
DATA LATCHES
OUT I/O IN
SHIFT REG
TRANSCEIVER I2C BUS
CHIP SELECT
CS0 CS1 CS2
RES PWR
GND VDD SDA SCL SO
GND_D
3034 10K 3031 10K
3715 10K
+5V_CD (Source Sel. 1018)
3046 2R2 9214
7006 BC807-25
6003 1N4148 +5V6
5,4V
3048 5K6 3053 5K6
7010 BC847B
3059 2K2 3062 10K
MIC_DET MUTE_LINE
2061 100p 3095 470R 3094 470R 2062 100p
I2C_DATA I2C_CLK
3,8V
2070 100n
3107 270R
6002 1N4148 +5V6 +5V
A
Power2001 40W SuperG Combi-Amplifier Part 2001 02 21

Regulator Board (Copperside view)

1171	A2
1400	B2
1401	B1
1402	A1
1403	B1
2400	A4
2402	A1
2403	A2
2404	A3
2405	A2
2406	B3
2407	B3
2408	A4
2409	B3
2410	A3
2411	A1
2412	B4
2413	B3
2415	B1
2416	B1
3403	A4
3404	A3
3405	A4
3406	A4
3407	A2
3409	A3
3410	A2
3411	B3
3412	A2
3413	A2
3414	A2
3415	A2
3416	A2
3417	A2
3418	A4
3419	B2
3420	B3
3421	B2
3422	A4
3423	A3
3424	A4
3425	A4
3426	B3
3427	B3
3428	B3
3430	A3
3431	B3
3432	B3
3433	B1
3434	B1
3435	B1
3436	A1
3437	A1
3438	A1
3439	A1
6400	A4
6401	A4
6402	A2
6404	A3
6405	A2
6406	B2
6407	B3
6409	A3
6411	A2
6412	A1
6413	B2
7401	A3
7402	A3
7403	A4
7405	A2
7406	A2
7407	A2
7408	A2
7409	B2
7410	A2
7411	A2
7412	B2
7413	A4
7414	B4
7415	B4
7417	A4
7419	A1
7420	A1
7421	A1
9172	A3
9174	A3
9401	A1
9402	A3
9403	A3
9404	A4
9405	A4
9406	A1
9410	A3
9411	A1
9412	A3
9413	B2
9414	A1
9415	A1
9416	B1
9417	A1
9419	A1
9420	A2

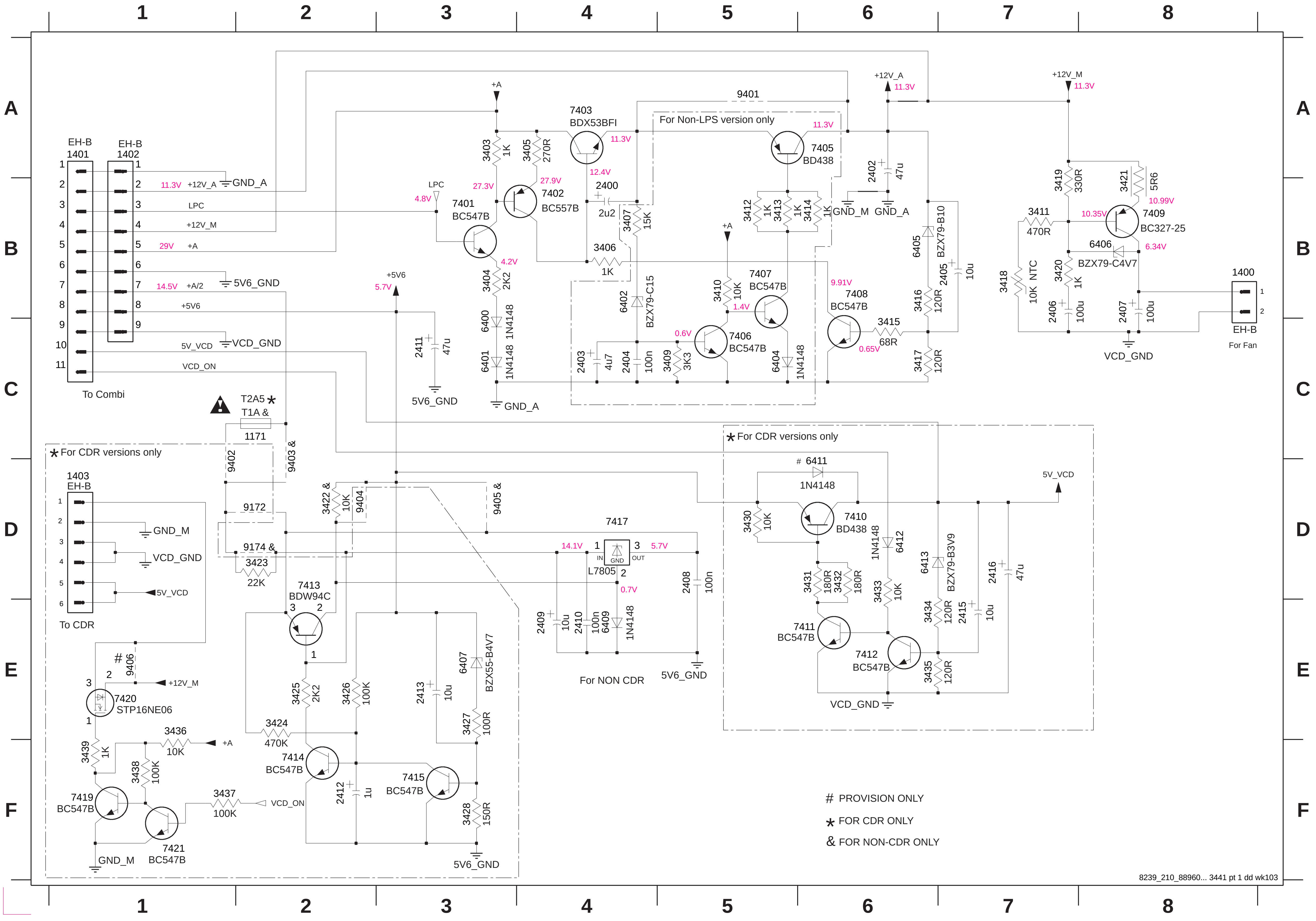

1
2
3
4
A
B
7420
7419
9401
7405
6402
6404
6400
6401
9406
3439
3436
7421
3412
3413
3414
3410
7407
3407
2403
7406
3409
2404
7401
7402
3404
2400
3405
3403
3406
7403
3438
3437
9419
2402
6405
3417
3416
3415
7408
2408
3418
9411
2405
1171
9403
9402
9410
3423
9172
9174
3424
9412
9405
2410
9404
3422
3425
1402
9417
9420
7410
3430
IN GND OUT
7413
7417
2411
9415
9414
6411
6409
6412
7411
7412
2409
2413
7414
7415
3426
6413
3432
3431
9413
3427
6407
9416
2416
2415
3428
1403
1401
3433
3435
3434
3421
3419
6406
7409
1400
2407
2406
3420
3411
2412
88960
E
C
B
S
G
D

This assembly drawing shows all possible versions. For components used in a specific version see schematic diagram respectively parts lists.

3139 113 3441 pt 1 dd wk 103

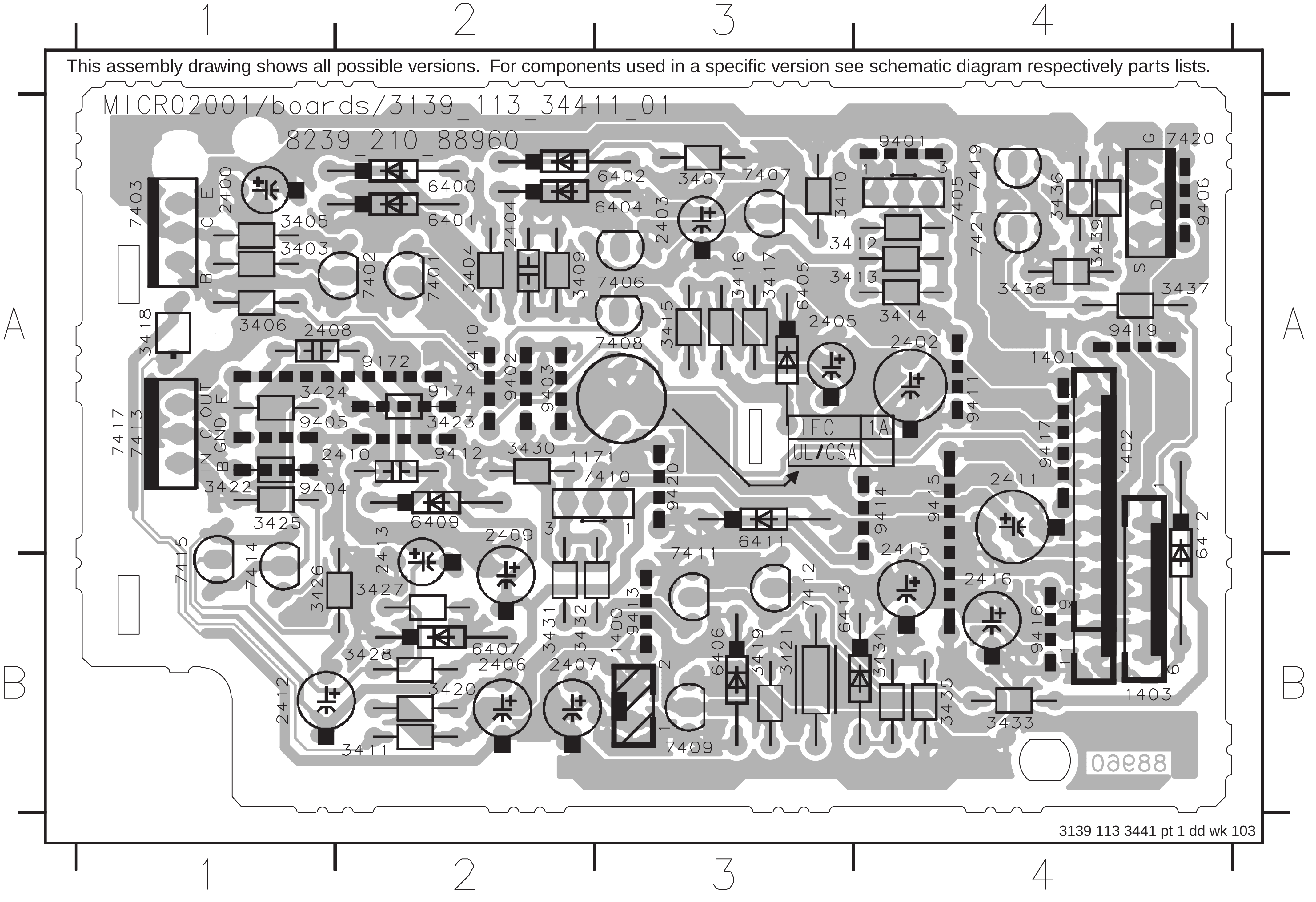
Circuit Diagram Regulator Board

1171 C2
1400 B8
1401 A1
1402 A1
1403 D1
2400 B4
2402 A6
2403 C4
2404 C4
2405 B7
2406 B7
2407 B8
2408 D5
2409 E4
2410 E4
2411 C3
2412 F2
2413 E3
2415 E7
2416 D7
3403 A3
3404 B3
3405 A4
3406 B4
3407 B4
3409 C5
3410 B5
3411 B7
3412 B5
3413 B5
3414 B6
3415 C6
3416 B6
3417 C6
3418 B7
3419 B7
3420 B7
3421 B8
3422 D2
3423 D2
3424 E2
3425 E2
3426 E2
3427 E3
3428 F3
3430 D5
3431 D6
3432 D6
3433 D6
3434 E6
3435 E6
3436 E1
3437 F1
3438 F1
3439 F1
6400 C3
6401 C3
6402 B4
6404 C5
6405 B6
6406 B8
6407 E3
6409 E4
6411 D6
6412 D6
6413 D6
7401 B3
7402 B4
7403 A4
7405 A6
7406 C5
7407 B5
7408 B6
7409 B8
7410 D6
7411 E6
7412 E6
7413 D2
7414 F2
7415 F3
7417 D4
7419 F1
7420 E1
7421 F1
9172 D2
9174 D2
9401 A5
9402 D1
9403 D2
9404 D2
9405 D3
9406 E1


1 2 3 4 5 6 7 8
A B C D E F
EH-B 1401
EH-B 1402
To Combi
11.3V +12V_A GND_A
LPC
+12V_M
29V +A
14.5V +A/2 5V6_GND
+5V6
5V_VCD VCD_GND
VCD_ON
+A
3403 1K
3405 270R
7403 BDX53BFI
11.3V
12.4V
27.3V
27.9V
4.8V
7401 BC547B
7402 BC557B
4.2V
3404 2K2
6400 1N4148
6401 1N4148
GND_A
+5V6
5.7V
2411 47u
5V6_GND
9401
For Non-LPS version only
7405 BD438
2400 2u2
3407 15K
3406 1K
6402 BZX79-C15
3412 1K
3413 1K
3414 1K
GND_M GND_A
2402 47u
+12V_A 11.3V
7407 BC547B
3410 10K
1.4V
0.6V
7406 BC547B
2403 4u7
2404 100n
3409 3K3
6404 1N4148
9.91V
7408 BC547B
3415 68R
0.65V
6405 BZX79-B10
3416 120R
2405 10u
3417 120R
+12V_M 11.3V
3419 330R
3421 5R6
10.99V
3411 470R
10.35V
7409 BC327-25
6406 BZX79-C4V7
6.34V
3418 10K NTC
3420 1K
2406 100u
2407 100u
VCD_GND
1400
EH-B
For Fan
T2A5 *
T1A &
1171
* For CDR versions only
1403 EH-B
GND_M
VCD_GND
5V_VCD
To CDR
9402
9403 &
9172
9174 &
3423 22K
3422 & 10K
9404
9405 &
7413 BDW94C
# 9406
+12V_M
7420 STP16NE06
3436 10K
+A
3439 1K
3438 100K
7419 BC547B
7421 BC547B
3437 100K
VCD_ON
GND_M
3424 470K
3425 2K2
3426 100K
7414 BC547B
2412 1u
2413 10u
6407 BZX55-B4V7
3427 100R
7415 BC547B
3428 150R
5V6_GND
7417
14.1V
5.7V
L7805
IN GND OUT
0.7V
2409 10u
2410 100n
6409 1N4148
2408 100n
For NON CDR
5V6_GND
* For CDR versions only
# 6411 1N4148
5V_VCD
3430 10K
7410 BD438
6412 1N4148
6413 BZX79-B3V9
2416 47u
3431 180R
3432 180R
3433 10K
3434 120R
2415 10u
7411 BC547B
7412 BC547B
3435 120R
VCD_GND
# PROVISION ONLY
* FOR CDR ONLY
& FOR NON-CDR ONLY
8239_210_88960... 3441 pt 1 dd wk103

Regulator Board (Componentside view)

1171	A2
1400	B3
1401	A4
1402	A4
1403	B4
2400	A1
2402	A4
2403	A3
2404	A2
2405	A3
2406	B2
2407	B2
2408	A1
2409	A2
2410	A2
2411	A4
2412	B1
2413	A2
2415	A4
2416	B4
3403	A1
3404	A2
3405	A1
3406	A1
3407	A3
3409	A2
3410	A3
3411	B2
3412	A3
3413	A3
3414	A4
3415	A3
3416	A3
3417	A3
3418	A1
3419	B3
3420	B2
3421	B3
3422	A1
3423	A2
3424	A1
3425	A1
3426	B1
3427	B2
3428	B2
3430	A2
3431	B2
3432	B2
3433	B4
3434	B4
3435	B4
3436	A4
3437	A4
3438	A4
3439	A4
6400	A2
6401	A2
6402	A3
6404	A3
6405	A3
6406	B3
6407	B2
6409	A2
6411	A3
6412	A4
6413	B3
7401	A2
7402	A2
7403	A1
7405	A4
7406	A3
7407	A3
7408	A3
7409	B3
7410	A3
7411	A3
7412	B3
7413	A1
7414	B1
7415	B1
7417	A1
7419	A4
7420	A4
7421	A4
9172	A2
9174	A2
9401	A4
9402	A2
9403	A2
9404	A1
9405	A1
9406	A4
9410	A2
9411	A4
9412	A2
9413	B3
9414	A4
9415	A4
9416	B4
9417	A4
9419	A4
9420	A3



This assembly drawing shows all possible versions. For components used in a specific version see schematic diagram respectively parts lists.

3139 113 3441 pt 1 dd wk 103

ELECTRICAL PARTSLIST POWER2001 40W Super-G Mains Board

MISCELLANEOUS

1200 ⚠	2422 086 10963	FUSE RAD 5A 250V IEC
1202 ⚠	4822 071 51252	FUSE 1.25A
1202 ⚠	4822 252 51121	FUSE T3,15A UL
1204 ⚠	2422 030 00328	MAINS SOCKET /37
1204 ⚠	4822 265 31015	MAINS SOCKET, IEC
1205 ⚠	2422 086 10786	FUSE RAD 4A 250V IEC
1206 ⚠	2422 129 16478	VOLTAGE SELECTOR
1207 ⚠	2422 086 10786	FUSE RAD 4A 250V IEC
1208 ⚠	4822 071 51252	FUSE 1.25A
1209	4822 267 10953	FLEX FOIL CONNECTOR 7P
1210 ⚠	2422 132 07402	RELAY 1P 12V
1211 ⚠	2422 086 10771	FUSE RAD 160mA 250V IEC
1212 ⚠	4822 071 51001	FUSE 100mA
5203 ⚠	3103 308 30610	STANDBY TRANSFORMER /22
⚠	3103 308 30790	MAINS TRANSFORMER /21
⚠	3103 308 30780	MAINS TRANSFORMER /22
⚠	3103 308 30770	MAINS TRANSFORMER /37

CAPACITORS

2200	4822 124 12012	4700µF	20%	25V
2201	4822 124 42367	3300µF	20%	35V
2202	5322 121 42386	100nF	5%	63V
2203	5322 121 42386	100nF	5%	63V
2204	5322 121 42386	100nF	5%	63V
2205	4822 124 80415	4700µF	20%	50V
2206	5322 121 42386	100nF	5%	63V
2207	4822 122 33449	47nF	30%	50V
2208	5322 124 41948	0,47µF	20%	50V
2209	2020 012 93547	100µF	20%	63V
2210	2020 012 93547	100µF	20%	63V
2211	4822 121 43526	47nF	5%	100V
2212	4822 121 43526	47nF	5%	100V
2213	4822 124 40255	100µF	20%	50V

RESISTORS

3200	4822 053 21106	10MΩ	5%	0,5W
3201	4822 116 52244	15kΩ	5%	0,5W
3202	4822 116 52276	3,9kΩ	5%	0,5W
3204	4822 116 52228	680Ω	5%	0,5W
3205	4822 116 52283	4,7kΩ	5%	0,5W

RESISTORS

3211	4822 052 10478	4,7Ω	5%	NFR
3212	4822 050 23303	33kΩ	1%	0,6W
3213	4822 116 52176	10Ω	5%	0,5W
3214	4822 116 52238	12kΩ	5%	0,5W

COILS

5220	4822 157 11832	400µH

DIODES

6200	4822 130 31878	1N4003G
6201	4822 130 31878	1N4003G
6202	4822 130 11139	GBU8D
6203	4822 130 30621	1N4148
6204	3198 010 58280	BZX79-B8V2
6204	4822 130 34174	BZX79-B4V7
6206	4822 130 31878	1N4003G
6207	4822 130 34142	BZX79-B33
6208	4822 130 30621	1N4148
6209	4822 130 30621	1N4148
6210	4822 130 31878	1N4003G
6211	4822 130 31878	1N4003G
6213	4822 130 31878	1N4003G
6214	4822 130 31878	1N4003G
6218	4822 130 30621	1N4148
6220	4822 130 30621	1N4148
6221	4822 130 30621	1N4148
6222	4822 130 30621	1N4148

DIODES

6223	4822 130 30621	1N4148

TRANSISTORS

7200	4822 130 40917	BD238
7203	4822 130 40959	BC547B

ELECTRICAL PARTSLIST POWER2001 40W Super-G Combi Board

MISCELLANEOUS

1001	4822 265 20553	CINCH SOCKET, 2 POLE
1004	4822 267 31729	CINCH SOCKET, 1 POLE
1006	4822 267 31729	CINCH SOCKET, 1 POLE
1013	4822 265 11515	FLEX FOIL CONNECTOR 8P
1014	4822 267 10733	FLEX FOIL CONNECTOR 4P
1018	4822 265 11553	FLEX FOIL CONNECTOR 19P
1022	4822 267 10953	FLEX FOIL CONNECTOR 7P
1025	2422 025 14518	FLEX FOIL CONNECTOR 9P
1026	4822 265 11553	FLEX FOIL CONNECTOR 19P
1300 ⚠	4822 252 11225	FUSE F3.15A IEC 250V
1301 ⚠	4822 252 11225	FUSE F3.15A IEC 250V
1304	4822 267 10953	FLEX FOIL CONNECTOR 7P
1307	4822 267 31176	SPEAKER TERMINAL

CAPACITORS

2000 ©	5322 126 11583	10nF	10%	63V
2003 ©	4822 126 14305	100nF	10%	16V
2006 ©	4822 126 14305	100nF	10%	16V
2011	4822 124 40769	4,7µF	20%	100V
2015	4822 124 40769	4,7µF	20%	100V
2017	4822 124 81286	47µF	20%	16V
2023	4822 124 40756	1µF	20%	100V
2025 ©	4822 126 13881	470pF	5%	50V
2027	4822 124 40756	1µF	20%	100V
2028 ©	4822 122 33752	15pF	5%	50V
2029 ©	4822 126 14305	100nF	10%	16V
2030	4822 124 81286	47µF	20%	16V
2031 ©	4822 126 13881	470pF	5%	50V
2032	4822 124 22651	1µF	20%	50V
2033	4822 124 23052	100µF	20%	16V

ELECTRICAL PARTSLIST POWER2001 40W Super-G Combi Board

CAPACITORS

2038 ©	4822 122 31765	100pF	5%	50V
2045 ©	4822 122 31765	100pF	5%	50V
2046	4822 124 23052	100µF	20%	16V
2047	4822 124 81286	47µF	20%	16V
2048	4822 124 22651	1µF	20%	50V
2051 ©	4822 126 14305	100nF	10%	16V
2055	4822 124 40764	22µF	20%	100V
2056	4822 124 22651	1µF	20%	50V
2057 ©	4822 126 13881	470pF	5%	50V
2058	4822 124 22651	1µF	20%	50V
2060 ©	4822 126 14305	100nF	10%	16V
2061 ©	4822 122 31765	100pF	5%	50V
2062 ©	4822 122 31765	100pF	5%	50V
2063 ©	4822 126 14305	100nF	10%	16V
2064 ©	4822 122 33753	150pF	5%	50V
2065 ©	4822 126 14305	100nF	10%	16V
2066 ©	4822 126 14305	100nF	10%	16V
2067 ©	3198 016 31020	1nF	5%	25V
2068 ©	4822 126 14305	100nF	10%	16V
2069	4822 124 40756	1µF	20%	100V
2070 ©	4822 126 14305	100nF	10%	16V
2080	4822 124 40756	1µF	20%	100V
2081	4822 124 40756	1µF	20%	100V
2300	4822 124 12255	10µF	20%	50V
2301 ©	4822 126 13193	4,7nF	10%	63V
2302 ©	4822 126 13193	4,7nF	10%	63V
2303 ©	4822 126 13193	4,7nF	10%	63V
2304 ©	4822 126 13193	4,7nF	10%	63V
2305	4822 124 40433	47µF	20%	25V
2306	4822 124 40433	47µF	20%	25V
2307 ©	4822 126 13193	4,7nF	10%	63V
2308 ©	4822 126 13193	4,7nF	10%	63V
2309	4822 124 22651	1µF	20%	50V
2310	4822 124 22651	1µF	20%	50V
2311	4822 124 40207	100µF	20%	25V
2312	4822 124 40207	100µF	20%	25V
2313	4822 124 40207	100µF	20%	25V
2314	4822 124 40207	100µF	20%	25V
2315 ©	4822 126 13193	4,7nF	10%	63V
2316 ©	4822 126 13193	4,7nF	10%	63V
2317	4822 126 12882	100nF	20%	50V
2318	4822 126 12882	100nF	20%	50V
2319	4822 121 43526	47nF	5%	100V
2320	4822 121 43526	47nF	5%	100V
2321	4822 121 43526	47nF	5%	100V
2322	4822 121 43526	47nF	5%	100V
2324 ©	4822 122 33777	47pF	5%	63V
2333	4822 124 40433	47µF	20%	25V
2334	4822 124 12255	10µF	20%	50V
2335	4822 124 12255	10µF	20%	50V
2336	4822 124 12255	10µF	20%	50V
2339 ©	4822 126 14305	100nF	10%	16V
2340 ©	4822 126 14305	100nF	10%	16V
2341	2020 012 93664	100µF	20%	50V
2501 ©	4822 126 13881	470pF	5%	50V
2502 ©	4822 126 13881	470pF	5%	50V
2503 ©	4822 126 13881	470pF	5%	50V
2504 ©	4822 126 13881	470pF	5%	50V
2505 ©	4822 126 13881	470pF	5%	50V
2506 ©	4822 126 13881	470pF	5%	50V
2507 ©	4822 126 13881	470pF	5%	50V
2508 ©	4822 126 13881	470pF	5%	50V
2509 ©	4822 126 13193	4,7nF	10%	63V
2510 ©	4822 126 13193	4,7nF	10%	63V

CAPACITORS

2511	5322 124 41948	0,47µF	20%	50V
2512	5322 124 41948	0,47µF	20%	50V
2513	4822 121 42408	220nF	5%	63V
2514	4822 121 42408	220nF	5%	63V
2515	4822 121 51252	470nF	5%	63V
2516	4822 121 51252	470nF	5%	63V
2517	4822 121 51252	470nF	5%	63V
2518	4822 121 51252	470nF	5%	63V
2521 ©	5322 126 11579	3,3nF	10%	63V
2522 ©	5322 126 11579	3,3nF	10%	63V
2523 ©	4822 126 14549	33nF	10%	16V
2524 ©	4822 126 14549	33nF	10%	16V
2525 ©	3198 016 31020	1nF	5%	25V
2530 ©	3198 016 31020	1nF	5%	25V
2544 ©	4822 122 31765	100pF	5%	50V
2545 ©	4822 122 31765	100pF	5%	50V
2546 ©	4822 126 14585	100nF	10%	50V
2547	4822 124 81286	47µF	20%	16V
2549 ©	4822 126 14305	100nF	10%	16V
2550	4822 124 40433	47µF	20%	25V
2551	4822 124 81151	22µF	20%	50V
2552 ©	2222 786 56641	22nF	10%	16V
2560	5322 124 41948	0,47µF	20%	50V
2563 ©	4822 126 14305	100nF	10%	16V
2700 ©	4822 122 31765	100pF	5%	50V
2701	5322 124 41948	0,47µF	20%	50V
2702 ©	4822 126 13881	470pF	5%	50V
2706 ©	4822 122 31765	100pF	5%	50V
2707 ©	4822 122 31765	100pF	5%	50V
2708	5322 124 41948	0,47µF	20%	50V
2709 ©	4822 126 13881	470pF	5%	50V
2713 ©	4822 122 31765	100pF	5%	50V
2714	4822 124 81286	47µF	20%	16V
2715 ©	3198 017 42230	22nF10%50V		
2716	4822 124 23052	100µF	20%	16V

RESISTORS

3014 ©	4822 051 30103	10kΩ	5%	0,06W
3015 ©	4822 117 12925	47kΩ	1%	0,06W
3016 ©	4822 051 30333	33kΩ	5%	0,06W
3017 ©	4822 051 30393	39kΩ	5%	0,06W
3018 ©	4822 051 30393	39kΩ	5%	0,06W
3021 ©	4822 051 30152	1,5kΩ	5%	0,06W
3022 ©	4822 051 30103	10kΩ	5%	0,06W
3024 ©	4822 051 30153	15kΩ	5%	0,06W
3026 ©	4822 051 30152	1,5kΩ	5%	0,06W
3027 ©	4822 051 30103	10kΩ	5%	0,06W
3028 ©	4822 051 30472	4,7kΩ	5%	0,06W
3029 ©	4822 051 30153	15kΩ	5%	0,06W
3031 ©	4822 051 30103	10kΩ	5%	0,06W
3032 ©	2120 108 91909	39Ω	5%	0,06W
3033 ©	2120 108 91909	39Ω	5%	0,06W
3034 ©	4822 051 30103	10kΩ	5%	0,06W
3035 ©	4822 051 30103	10kΩ	5%	0,06W
3041 ©	4822 051 30273	27kΩ	5%	0,06W
3042 ©	4822 051 30102	1kΩ	5%	0,06W
3043 ©	4822 051 30152	1,5kΩ	5%	0,06W
3046	4822 116 81154	2,2Ω	5%	0,5W
3048 ©	4822 051 30562	5,6kΩ	5%	0,06W
3050 ©	4822 051 30273	27kΩ	5%	0,06W
3052 ©	4822 051 30152	1,5kΩ	5%	0,06W
3053 ©	4822 051 30562	5,6kΩ	5%	0,06W
3057 ©	4822 051 30102	1kΩ	5%	0,06W
3059 ©	4822 051 30222	2,2kΩ	5%	0,06W

ELECTRICAL PARTSLIST POWER2001 40W Super-G Combi Board

RESISTORS

3062©	4822 051 30103	10kΩ	5%	0,06W
3065©	2120 108 91909	39Ω	5%	0,06W
3066©	2120 108 91909	39Ω	5%	0,06W
3067	4822 116 52289	5,6kΩ	5%	0,16W
3071©	4822 051 30103	10kΩ	5%	0,06W
3073©	4822 051 30471	470Ω	5%	0,06W
3077©	4822 051 30222	2,2kΩ	5%	0,06W
3079©	4822 051 30472	4,7kΩ	5%	0,06W
3081©	4822 051 30222	2,2kΩ	5%	0,06W
3082©	4822 051 30222	2,2kΩ	5%	0,06W
3083©	4822 051 30471	470Ω	5%	0,06W
3084©	4822 117 11817	1,2kΩ	1%	0,06W
3085©	4822 051 30008	CHIP JUMPER 0603		
3087©	4822 051 30154	150kΩ	5%	0,06W
3088©	4822 051 30334	330kΩ	5%	0,06W
3089©	4822 117 12864	82kΩ	5%	0,6W
3091©	4822 051 30154	150kΩ	5%	0,06W
3094©	4822 051 30471	470Ω	5%	0,06W
3095©	4822 051 30471	470Ω	5%	0,06W
3096©	4822 051 30332	3,3kΩ	5%	0,06W
3097©	4822 051 30332	3,3kΩ	5%	0,06W
3098©	4822 051 20399	39Ω	5%	0,1W
3099©	4822 051 30561	560Ω	5%	0,06W
3100©	4822 051 30222	2,2kΩ	5%	0,06W
3101©	4822 051 30471	470Ω	5%	0,06W
3102©	4822 051 30221	220Ω	5%	0,06W
3105©	4822 051 30103	10kΩ	5%	0,06W
3106©	4822 051 30103	10kΩ	5%	0,06W
3107©	4822 051 30271	270Ω	5%	0,06W
3110©	4822 051 30103	10kΩ	5%	0,06W
3111©	4822 051 30103	10kΩ	5%	0,06W
3300	4822 116 52276	3,9kΩ	5%	0,5W
3301©	4822 051 30221	220Ω	5%	0,06W
3302©	4822 051 30221	220Ω	5%	0,06W
3303©	4822 051 30331	330Ω	5%	0,06W
3304©	4822 051 30331	330Ω	5%	0,06W
3305©	4822 051 30471	470Ω	5%	0,06W
3306©	4822 051 30471	470Ω	5%	0,06W
3307©	4822 051 30471	470Ω	5%	0,06W
3308©	4822 051 30471	470Ω	5%	0,06W
3309	4822 050 24708	4,7Ω	1%	0,6W
3310	4822 050 24708	4,7Ω	1%	0,6W
3311	4822 050 24708	4,7Ω	1%	0,6W
3312	4822 050 24708	4,7Ω	1%	0,6W
3314©	4822 051 30222	2,2kΩ	5%	0,06W
3315	4822 116 52219	330Ω	5%	0,5W
3318©	4822 051 30332	3,3kΩ	5%	0,06W
3323©	4822 117 12925	47kΩ	1%	0,06W
3326©	4822 051 30472	4,7kΩ	5%	0,06W
3327©	4822 051 30472	4,7kΩ	5%	0,06W
3328©	4822 051 30472	4,7kΩ	5%	0,06W
3329©	4822 051 30332	3,3kΩ	5%	0,06W
3331©	4822 051 30331	330Ω	5%	0,06W
3336©	4822 051 30562	5,6kΩ	5%	0,06W
3337©	4822 051 30562	5,6kΩ	5%	0,06W
3340	4822 116 52219	330Ω	5%	0,5W
3341©	4822 051 30472	4,7kΩ	5%	0,06W
3342©	4822 051 30103	10kΩ	5%	0,06W
3353	4822 116 52249	1,8kΩ	5%	0,16W
3359©	4822 117 13632	100kΩ	1%	0,06W
3360©	4822 051 30153	15kΩ	5%	0,06W
3361©	4822 051 30102	1kΩ	5%	0,06W
3362©	4822 051 30682	6,8kΩ	5%	0,06W
3363©	4822 051 30102	1kΩ	5%	0,06W
3364©	4822 051 30333	33kΩ	5%	0,06W

RESISTORS

3365©	4822 051 30684	680kΩ	5%	0,06W
3366	4822 050 21003	10kΩ	2%	0,25W
3367©	4822 051 30683	68kΩ	5%	0,06W
3377©	4822 117 12925	47kΩ	1%	0,06W
3378©	4822 051 30102	1kΩ	5%	0,06W
3379©	4822 051 30222	2,2kΩ	5%	0,06W
3380©	4822 051 30222	2,2kΩ	5%	0,06W
3503©	4822 051 30153	15kΩ	5%	0,06W
3505©	4822 051 30223	22kΩ	5%	0,06W
3506©	4822 051 30223	22kΩ	5%	0,06W
3507©	4822 117 12902	8,2kΩ	1%	0,06W
3508©	4822 117 12902	8,2kΩ	1%	0,06W
3509©	4822 051 30562	5,6kΩ	5%	0,06W
3510©	4822 051 30562	5,6kΩ	5%	0,06W
3511©	4822 051 30123	12kΩ	5%	0,06W
3512©	4822 051 30123	12kΩ	5%	0,06W
3513©	4822 051 30562	5,6kΩ	5%	0,06W
3516©	4822 051 30562	5,6kΩ	5%	0,06W
3540©	4822 051 30471	470Ω	5%	0,06W
3541©	4822 051 30471	470Ω	5%	0,06W
3543	4822 116 52249	1,8kΩ	5%	0,16W
3544©	4822 051 30103	10kΩ	5%	0,06W
3565©	4822 051 30153	15kΩ	5%	0,06W
3700©	4822 051 30273	27kΩ	5%	0,06W
3701©	4822 051 30471	470Ω	5%	0,06W
3704©	4822 051 30682	6,8kΩ	5%	0,06W
3705©	4822 051 30273	27kΩ	5%	0,06W
3706©	4822 051 30682	6,8kΩ	5%	0,06W
3707©	4822 051 30273	27kΩ	5%	0,06W
3709©	4822 051 30471	470Ω	5%	0,06W
3711©	4822 051 30273	27kΩ	5%	0,06W
3712©	4822 051 30472	4,7kΩ	5%	0,06W
3713	4822 052 10109	10Ω	5%	NFR
3714©	4822 051 30472	4,7kΩ	5%	0,06W
3716©	4822 051 30339	33Ω	5%	0,06W
3717©	4822 051 30339	33Ω	5%	0,06W
3718©	4822 051 30339	33Ω	5%	0,06W
4201©	4822 051 30008	CHIP JUMPER 0603		
4202©	4822 051 30008	CHIP JUMPER 0603		
4203©	4822 051 30008	CHIP JUMPER 0603		
4204©	4822 051 30008	CHIP JUMPER 0603		
4205©	4822 051 30008	CHIP JUMPER 0603		
4206©	4822 051 30008	CHIP JUMPER 0603		
4207©	4822 051 30008	CHIP JUMPER 0603		
4208©	4822 051 30008	CHIP JUMPER 0603		
4209©	4822 051 30008	CHIP JUMPER 0603		
4210©	4822 051 30008	CHIP JUMPER 0603		
4211©	4822 051 30008	CHIP JUMPER 0603		
4212©	4822 051 30008	CHIP JUMPER 0603		
4214©	4822 051 30008	CHIP JUMPER 0603		
4215©	4822 051 30008	CHIP JUMPER 0603		
4216©	4822 051 30008	CHIP JUMPER 0603		
4217©	4822 051 30008	CHIP JUMPER 0603		
4219©	4822 051 30008	CHIP JUMPER 0603		
4220©	4822 051 30008	CHIP JUMPER 0603		
4221©	4822 051 30008	CHIP JUMPER 0603		
4222©	4822 051 30008	CHIP JUMPER 0603		
4223©	4822 051 30008	CHIP JUMPER 0603		
4224©	4822 051 30008	CHIP JUMPER 0603		
4225©	4822 051 30008	CHIP JUMPER 0603		
4226©	4822 051 30008	CHIP JUMPER 0603		
4227©	4822 051 30008	CHIP JUMPER 0603		
4228©	4822 051 30008	CHIP JUMPER 0603		
4229©	4822 051 30008	CHIP JUMPER 0603		
4230©	4822 051 30008	CHIP JUMPER 0603		

ELECTRICAL PARTSLIST POWER2001 40W Super-G Combi Board

RESISTORS

4231©	4822 051 30008	CHIP JUMPER 0603
4232©	4822 051 30008	CHIP JUMPER 0603
4233©	4822 051 30008	CHIP JUMPER 0603
4234©	4822 051 30008	CHIP JUMPER 0603
4235©	4822 051 30008	CHIP JUMPER 0603

COILS

5001	2422 536 00019	TRANSFORMER, DIGITAL OUT
5300	4822 157 62255	COIL 18,5 TURNS
5301	4822 157 62255	COIL 18,5 TURNS
5302	4822 157 62255	COIL 18,5 TURNS
5303	4822 157 62255	COIL 18,5 TURNS
5700	4822 156 21721	2,2µH

DIODES

6001	4822 130 30621	1N4148
6002	4822 130 30621	1N4148
6003	4822 130 30621	1N4148
6005	4822 130 61219	BZX79-C10
6300	4822 130 31878	1N4003G
6301	4822 130 31878	1N4003G
6302	4822 130 31878	1N4003G
6303	4822 130 31878	1N4003G
6304	4822 130 80791	BYV28-200/20
6306	4822 130 30621	1N4148
6307	3198 010 53980	DIO REG BZX79-B3V9
6308	5322 130 31938	BYV27-200
6315	4822 130 34398	BZX79-C24
6323	4822 130 30621	1N4148
6324	4822 130 34278	BZX79-C6V8

DIODES

6325	4822 130 31878	1N4003G
6326	4822 130 30621	1N4148
6327	4822 130 30621	1N4148
6328	4822 130 34174	BZX79-B4V7
6331	4822 130 30621	1N4148
6332	4822 130 30621	1N4148

TRANSISTORS

7000©	4822 130 60373	BC856B
7004©	4822 130 42804	BC817-25
7006©	5322 130 60845	BC807-25
7009©	4822 130 42804	BC817-25
7010©	4822 130 60511	BC847B
7011©	4822 130 42804	BC817-25
7012©	4822 130 42804	BC817-25
7013©	4822 130 60373	BC856B
7015©	4822 130 60511	BC847B
7300©	4822 130 60511	BC847B
7304	4822 130 11578	STP16NE06
7307©	4822 130 60373	BC856B
7308©	4822 130 60511	BC847B
7309	4822 130 11336	STP16NE06FP
7310©	4822 130 60373	BC856B
7313©	4822 130 60373	BC856B
7325©	4822 130 60511	BC847B
7326©	4822 130 60373	BC856B
7328©	4822 130 42804	BC817-25
7329©	4822 130 42804	BC817-25
7505©	4822 130 60511	BC847B

INTEGRATED CIRCUITS

6000	4822 209 72042	MC78L05ACP, STABILIZER
7005©	4822 209 17345	M62320FP, I2C SHIFT REGISTER
7016©	4822 209 17235	74LVU04D, 6-FOLD INVERTER
7301	9322 153 02682	AN7591, POWER STAGE
7302	9322 153 02682	AN7591, POWER STAGE
7506©	9322 150 74668	TDA7468D, SOURCE SEL. & SOUND
7700©	4822 209 31378	NJM4556M, 2-FOLD OP-AMP.

ELECTRICAL PARTSLIST POWER2001 40W Super-G Regulator Board

MISCELLANEOUS

1171 ⚠	4822 071 51002	FUSE T1A

CAPACITORS

2400	4822 124 22652	2,2µF	20%	50V
2402	4822 124 40433	47µF	20%	25V
2403	4822 124 22726	4,7µF	20%	35V
2404	4822 126 12882	100nF	20%	50V
2405	4822 124 11947	10µF	20%	16V
2406	4822 124 41643	100µF	20%	16V
2407	4822 124 41643	100µF	20%	16V
2408	4822 126 12882	100nF	20%	50V
2409	4822 124 40248	10µF	20%	63V
2410	4822 126 12882	100nF	20%	50V
2411	4822 124 12233	47µF	20%	25V

RESISTORS

3403	4822 050 11002	1kΩ	5%	0,2W
3404	4822 116 52256	2,2kΩ	5%	0,16W
3405	4822 116 83876	270Ω	5%	0.16W
3406	4822 050 11002	1kΩ	5%	0,2W
3407	4822 116 52244	15kΩ	5%	0,5W
3409	4822 116 52269	3,3kΩ	5%	0,5W
3410	4822 050 21003	10kΩ	2%	0,25W
3411	4822 116 83883	470Ω	5%	0,16W
3412	4822 050 11002	1kΩ	5%	0,2W
3413	4822 050 11002	1kΩ	5%	0,2W
3414	4822 050 11002	1kΩ	5%	0,2W
3415	4822 116 52199	68Ω	5%	0,16W
3416	4822 116 52206	120Ω	5%	0,5W
3417	4822 116 52206	120Ω	5%	0,5W
3418	4822 117 12063	10kΩ	NTC	
3419	4822 116 52219	330Ω	5%	0,5W
3420	4822 050 11002	1kΩ	5%	0,2W
3421	4822 052 10568	5,6Ω	5%	0,33W
3422	4822 050 21003	10kΩ	2%	0,25W

DIODES

6400	4822 130 30621	1N4148
6401	4822 130 30621	1N4148
6402	4822 130 34281	BZX79-C15
6404	4822 130 30621	1N4148
6405	4822 130 61219	BZX79-C10
6406	4822 130 31981	BZX79-B3V9
6406	4822 130 34174	BZX79-B4V7
6409	4822 130 30621	1N4148

TRANSISTORS

7401	4822 130 40959	BC547B
7402	4822 130 44568	BC557B
7403	9322 139 23687	BDX53BFP
7405	4822 130 40995	BD438
7406	4822 130 40959	BC547B
7407	4822 130 40959	BC547B
7408	4822 130 40959	BC547B
7409	4822 130 41246	BC327-25

INTEGRATED CIRCUITS

7417	4822 209 31841	L7805CP, Voltage Regulator

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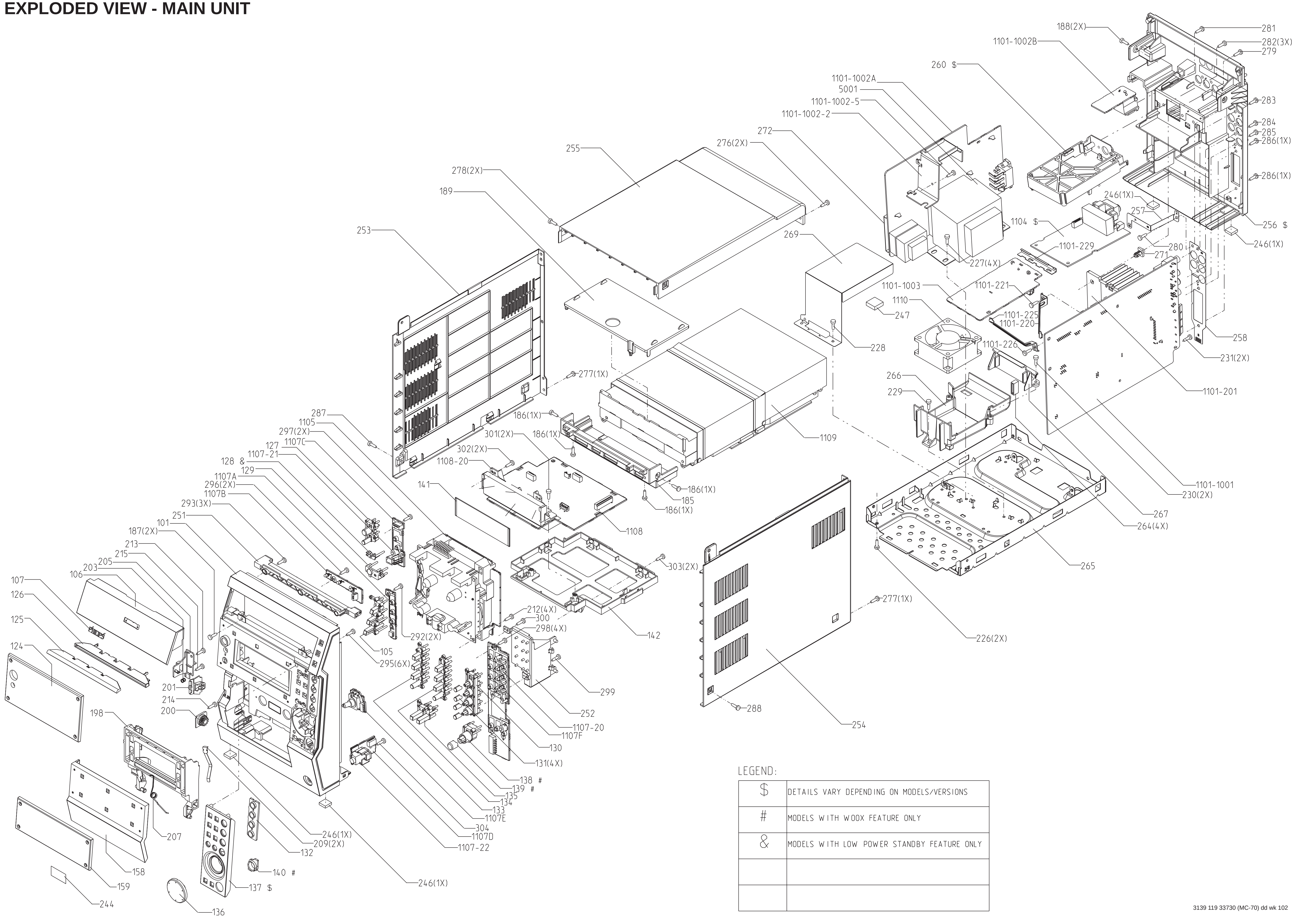
EXPLODED VIEW - MAIN UNIT


188(2X)
281
282(3X)
279
1101-1002B
260 $
283
284
285
286(1X)
286(1X)
1101-1002A
5001
1101-1002-5
1101-1002-2
272
276(2X)
255
278(2X)
189
253
246(1X)
257
256 $
1104 $
246(1X)
1101-229
280
271
227(4X)
269
1101-1003
1101-221
1110
247
1101-225
1101-220
228
1101-226
258
231(2X)
266
229
1101-201
277(1X)
186(1X)
1109
287
1105
297(2X)
1107C
127
1107-21
128 &
129
1107A
296(2X)
1107B
293(3X)
251
101
187(2X)
213
215
205
203
106
107
126
125
124
301(2X)
186(1X)
302(2X)
1108-20
141
186(1X)
185
186(1X)
1108
1101-1001
230(2X)
267
264(4X)
265
303(2X)
142
277(1X)
226(2X)
212(4X)
300
298(4X)
292(2X)
105
295(6X)
299
252
1107-20
1107F
130
131(4X)
201
214
200
198
207
158
159
244
136
137 $
140 #
132
209(2X)
246(1X)
1107-22
1107D
304
1107E
133
134
135
139 #
138 #
246(1X)
288
254

LEGEND:

$	DETAILS VARY DEPENDING ON MODELS/VERSIONS
#	MODELS WITH WOOX FEATURE ONLY
&	MODELS WITH LOW POWER STANDBY FEATURE ONLY

MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

101	3139 118 15230	Cabinet Front /21/21M/37
101	3139 118 15220	Cabinet Front /22
105	3139 118 14920	Button Set DTC Chrome
106	3139 118 15240	Cover Tray DTC
107	4822 459 11086	Badge Name Philips
124	3139 118 15260	Window Display /21/21M/37
124	3139 118 15040	Window Display /22
125	3139 114 71610	Lightguide Wash
126	3139 114 71620	Housing Lightguide Wash
127	3139 118 15010	Button Set Power Chrome
130	3139 114 71770	Button Set Source
131	3139 118 14990	Cap Source Chrome
133	3139 118 14960	Button Set Control Left
134	3139 118 14970	Button Set Control Right
135	3139 118 14980	Button Set Treble/Bass
136	3139 118 14950	Knob Jog Chrome
137	3139 118 14940	Cover Display
138	3139 114 71780	Button Set WOOX
139	3139 118 15000	Cap WOOX Chrome
141	3139 113 27050	Cut Sheet Display
158	3139 118 15250	Cover Cassette
159	3139 118 15060	Window Cassette
189 *	3139 118 15780	Plate Transport
198	3139 114 68620	Door Cassette Left
200	4822 529 10322	Damper Assembly
201	3139 114 68640	Push Catch Left
203	4822 492 11344	Spring Compression
205	4822 402 11245	Bracket Left
207	3139 111 01390	Spring Torsion Left
209	4822 492 42787	Spring Cassette
246	3139 113 27140	Foot Rubber 4mm
252	3139 114 71560	Bracket Combi
253	3139 114 71510	Panel Left
254	3139 114 71520	Panel Right
255	3139 114 71530	Cover Top
256	3139 114 71490	Panel Rear /21/22/37
256	3139 114 73250	Panel Rear /21M
271	3139 114 71010	Stopper Heatsink
350	3139 118 78550	Loudspeaker Box /21/21M/22
350	3139 118 78540	Loudspeaker Box /37
351	4822 303 50063	FM Aerial /21/21M/22
351	4822 320 11094	FM Antenna Wire /37
356	3139 118 78640	Remote Control /21/21M/37
356	3139 118 78630	Remote Control /22
384	4822 303 50082	AM Frame Antenna
385	2422 070 98151 ⚠	Mains Cord /21/21M/22
385	2422 070 98152 ⚠	Mains Cord /37
386	4822 263 21092 ⚠	Adapter Plug 6A 250V /21
387	3139 115 20780	Instruction For Use /21/21M
387	3139 115 20740	Instruction For Use /22
387	3139 115 20750	Instruction For Use /37
1110	4822 361 11161	Cooling Fan KD1206PTS3
1131	3139 110 34970	Flex Cable 19pin 18cm AD
1133	3139 110 35080	Flex Cable 9pin 18cm AD
1134	3139 110 35240	Flex Cable 8pin 28cm AD
1135	3139 110 35230	Flex Cable 7pin 22cm AD
1136	4822 320 12752	Flex Cable 7pin 18cm AD
1137	3139 110 35250	Flex Cable 4pin 12cm AD
1138	3139 110 34970	Flex Cable 19pin 18cm AD
1141	4822 320 12752	Flex Cable 7pin 18cm AD
1142	3139 110 34610	Flex Cable 11pin 18cm AD
1143	3139 110 34950	Flex Cable 7pin 12cm AD
5001	3103 308 30790 ⚠	Mains Transformer /21/21M
5001	3103 308 30780 ⚠	Mains Transformer /22
5001	3103 308 30770 ⚠	Mains Transformer /37
	9965 000 07824	Cloth Grille Assembly

Note: Only the parts mentioned in this list are normal service spare parts.

* Pos 189 is used for transportatiion only, it must be removed before playing CD.

SCREW LISTS - MAIN UNIT

186	D3 x 10
187	D3 x 10
188	D3 x 10
212	D3 x 12
213	D3 x 12
214	D3 x 12
215	D3 x 12
226	M3 x 6
227	M3 x 6
228	M3 x 6
229	M3 x 6
230	D3 x 10
231	M3 x 10
276	D3 x 12
277	M3 x 10
278	D3 x 10
279	D3 x 16
280	D3 x 8
281	D3 x 10
282	D3 x 10
283	D3 x 10
284	D3 x 10
285	D3 x 10
286	D3 x 10
287	D3 x 10
288	D3 x 10
292	D3 x 10
293	D3 x 20
295	D2 x 8
296	D3 x 10
297	D3 x 10
298	D3 x 10
299	D3 x 10
300	D3 x 10
301	D3 x 10
302	D3 x 10
303	D3 x 10
304	D3 x 12

SCREW LISTS - Power 2001 Module

D2 x 8	Regulator pcb / Heat shield to Heatsink
D2.5 x 8	Regulator Transistor / IC to Heatsink
D3 x 10	Brackets / IC Clamping Springs to Heatsink
M3 x 8	Rectifier diode to Heatsink